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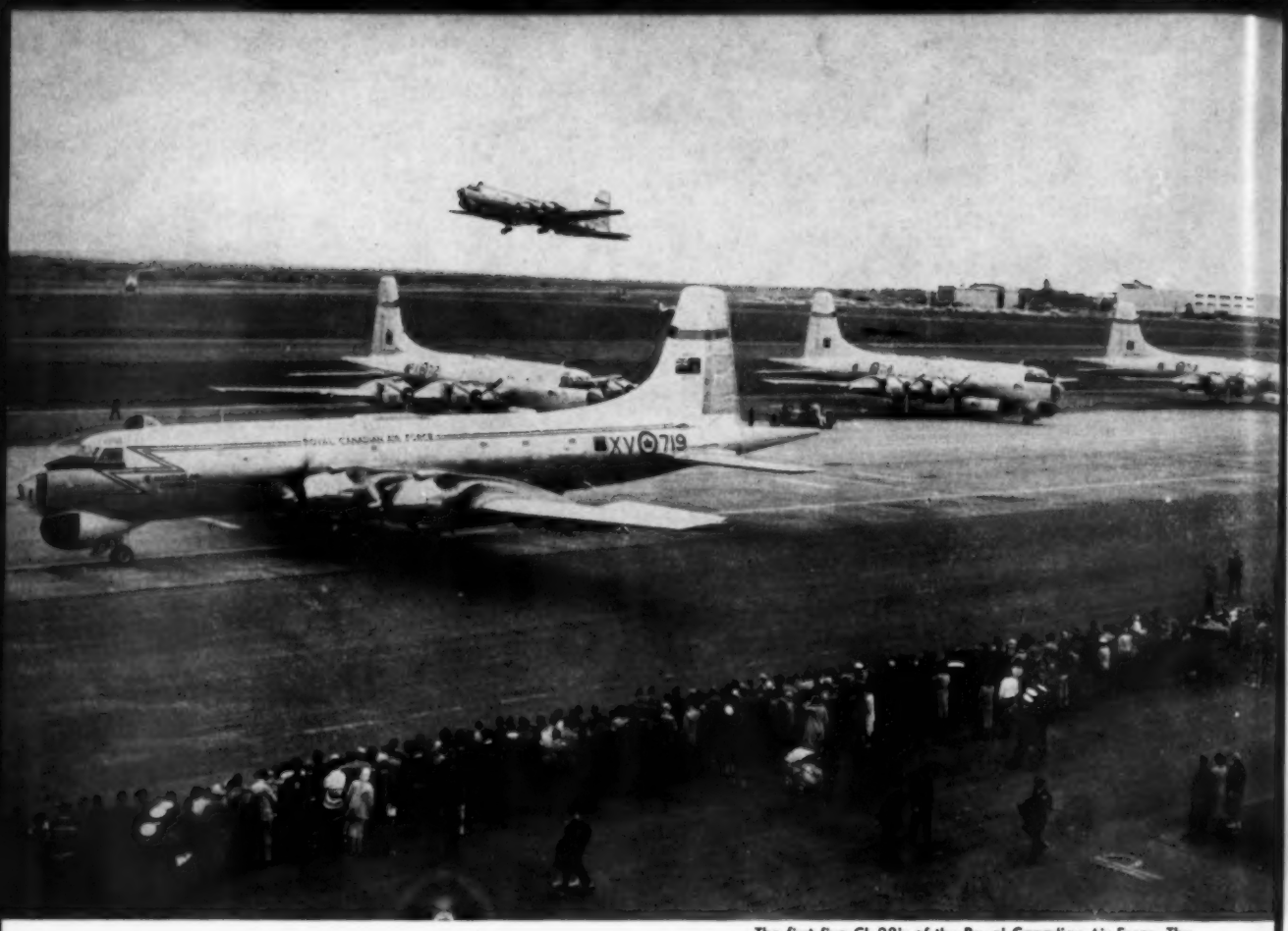

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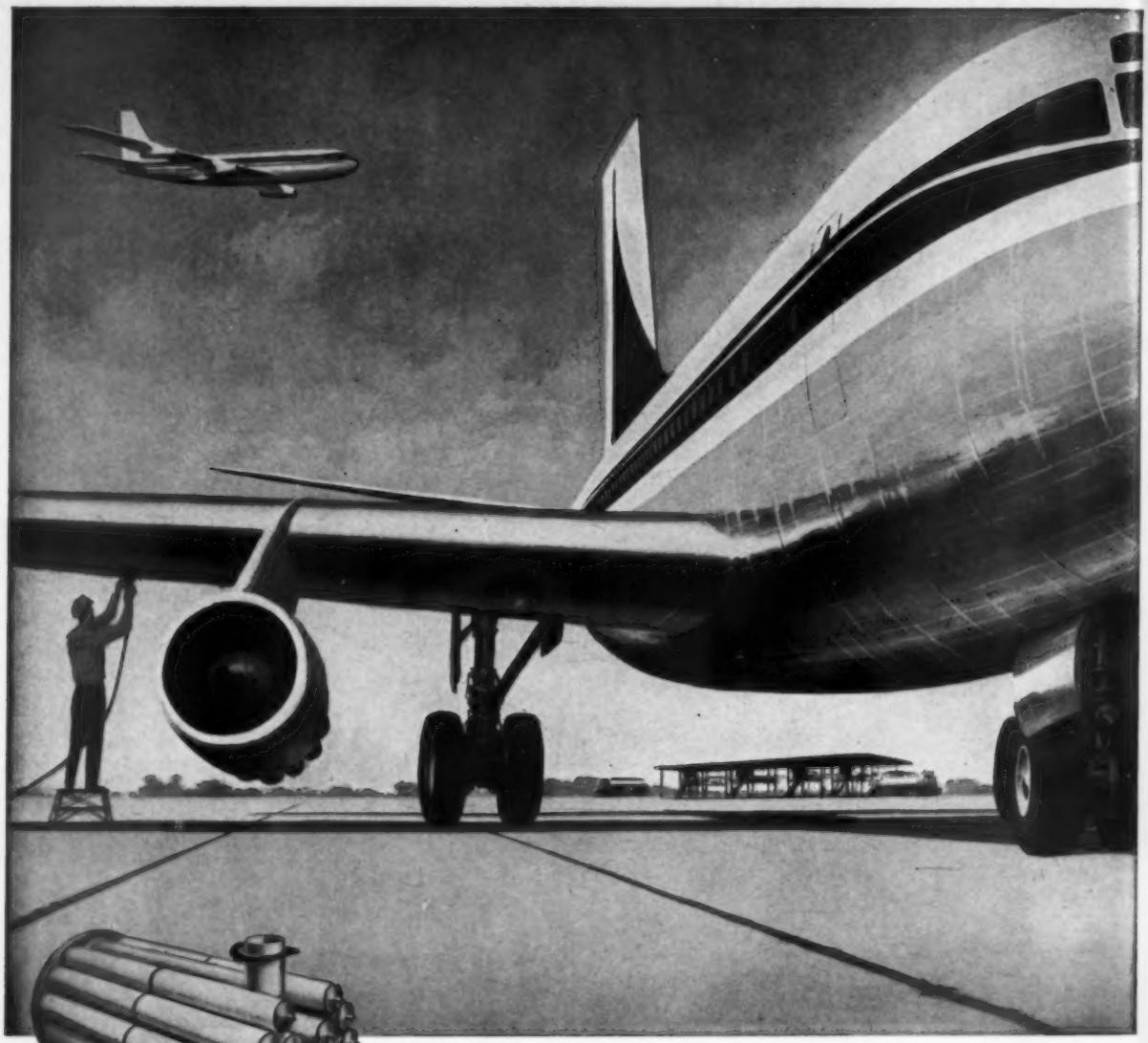

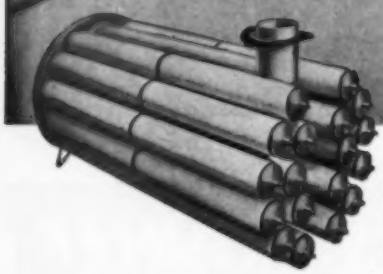

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AMERICAN AVIATION

DECEMBER 1, 1958—VOL. 22, No. 14

WORLD'S LARGEST AVIATION PUBLISHERS

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Publishing Information: Published every other Monday by American Aviation Publications, Inc., Washington, D.C. Printed at The Telegraph Press, Harrisburg, Pa. Accepted as controlled circulation publication at Washington, D.C. and Harrisburg, Pa.

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Subscription Rates: Single copies—$1.00. For U.S. and Canada—$10.00 for 1 year. Other countries—$15.00 for 1 year. Subscriptions limited to aviation industry personnel.

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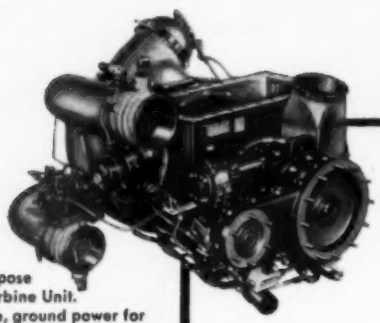

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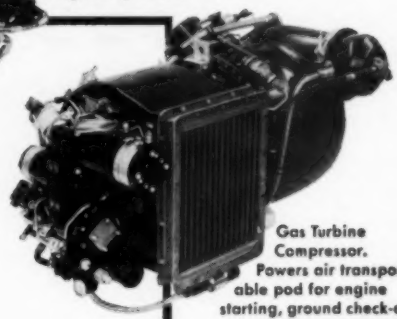

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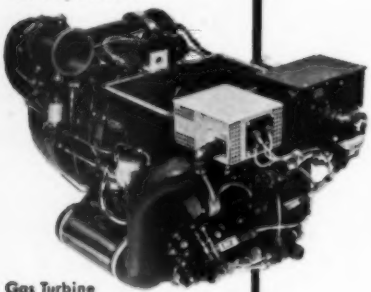

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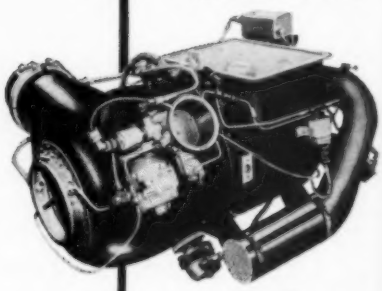

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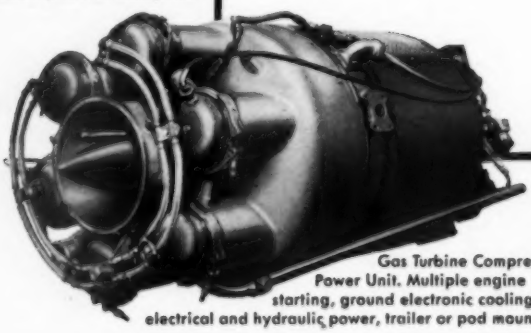
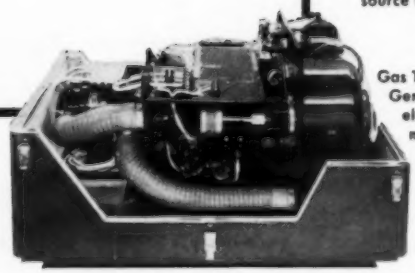


Gas Turbine Compressor Power Unit. Multiple engine starting, ground electronic cooling, electrical and hydraulic power, trailer or pod mounted.



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So Robert Quick Got His Strike

Only in a tolerant democracy such as we boast having in the United States could there have been such an abuse of rights and privileges and thumbing of nose at established legal processes as those exercised with unswerving personal determination by a former Capital Airlines painter by the name of Robert Quick.

As chairman of District 144 of the International Association of Machinists, Robert Quick achieved truly remarkable success in a demonstration of personal power. But that's about all.

For 35 long days Robert Quick was able to bend a large company to his own inflexible will. He said he'd show 'em, and he did. He furloughed 5,000 employees and cost them their wages. He stripped his company of $350,000 a day in revenues. He inconvenienced the traveling public. He kept investors jittery. He really had himself a ball.

Above all, Robert Quick single-handedly forced an already-weak company into a face-to-face battle with bankruptcy. Capital is in existence as a going concern today only because its competitors with genuine foresight for the common good formed a mutual assistance pact to keep it alive. Only in a tolerant democracy could a minor union leader grow into such a position of power.

Robert Quick warned last year that 1958 was to be a year of airline strikes. He made good on his forecast. He got a deadly, costly, senseless strike that hurt a lot of people.

He also got a settlement. But that settlement after 35 long days achieved nothing that wasn't available many weeks ago. Whatever puny remaining "gains" that were achieved by the dragging hold-out had long since been washed out by crippling the general financial structure and economic health of the company that pays the wages.

Robert Quick may well know, himself, what all sensible and informed people know—nobody wins a strike. But the history of the negotiations quite clearly indicates that Robert Quick was in no mood to follow orderly processes. Where else but in a tolerant democracy can a minor union leader thumb his nose at a Presidential Emergency Board? Or scoff at arbitration? Had Robert Quick had the main interests of employees at heart, he could have swung a favorable settlement long ago. But one can't demonstrate invincible power by compromising, and Robert Quick had to make good on his own personal objectives. The conclusion is inescapable that he would have been a very unhappy man if he hadn't forced through his strike.

Robert Quick well knows how to control his men. The by-laws of the union call for secret balloting, but Robert Quick knows all too well that you can't risk secret balloting when one is in a fight for power and domination. You have to know who votes "yes" and who votes "no," and you let everybody know by inflammatory haranguing prior to balloting that anyone who votes "yes" is nothing but a scab.

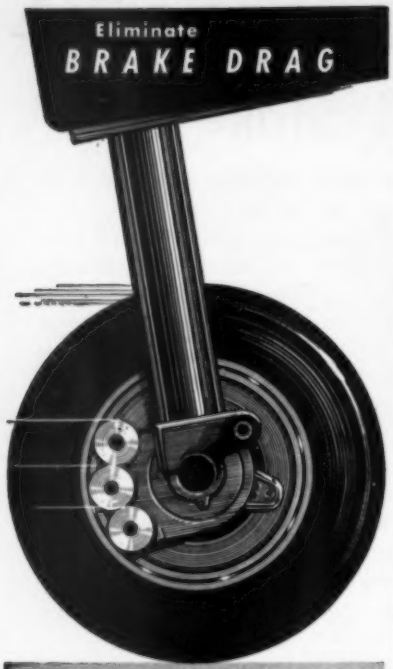
It was a cute ballot which Robert Quick used to keep his members in line. There was a box for "yes" and there was a box for "no." There was a stub on the ballot to be signed and torn off at the time of voting. There was an identical number on both portions. So Robert Quick could know very rapidly how each member voted. Some might call this blackmail, but Robert Quick undoubtedly calls this system orderly processes of democracy.

The Capital strike was a sordid, shabby chapter of local union leadership. It was a challenge to industry management, to the national headquarters of the International Association of Machinists, and to democratic processes. There is ample reason to believe that the national IAM is impotent to control the few strike-happy hot-heads down below who feel personal obligations to demonstrate their ability to achieve real inflexible power.

The labor situation in the air transport industry is deadly critical. At long last some of the airline managements have become aware of the pattern of union activity which, if continued, will wreck the industry and saddle it with burdens from which it can never get released, as per the railroads. Those managements who haven't learned their lessons will force the whole industry (and in turn the public) to suffer.

In these days it takes far more guts to combat reckless union leadership than it does to call and stage a long strike. To this end David Baker, Capital's president, deserves the highest sort of commendation, as do also the other five presidents who comprise the mutual assistance pact. Naturally the pact is called a cartel, but a cartel is restraint of trade. Where else but in a tolerant democracy could you find competitors banding together to assure the continuance of competition? Such a move is constructive. A strike which unnecessarily strips employees of needed pay and cripples a company to the edge of bankruptcy is to the credit of no one.

Wayne W. Parrish



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BUSINESS

Contracts to Watch

Look for a contract to Lockheed Aircraft Company to modify the F-104's to provide for upward rather than downward ejection. (See page 24). The Lockheed proposal has been evaluated and reportedly approved by ARDC.

AF has given General Electric the green-light on the J85 high thrust to weight ratio engine with the award of a contract to begin preproduction tooling. Engine is facing heavy competition, however from Pratt & Whitney's JT-12 and a long product improvement program can be expected.

Airborne Electronics:

Sperry Phoenix Co., Div. of Sperry Rand Corp., Phoenix, Ariz.—$176,900 AMC contract for components for the E-4 AFCS used in C-130 aircraft.

Lockeed Aircraft Corp., Burbank, Calif.—$36 million Navy contract for fabrication, assembly and installation of submarine detection equipment in P2V-5 and P2V-7 aircraft.

Electronic Specialty Co., Los Angeles, Calif.—$100,000 contract from Convair Div. of General Dynamics Corp. for electronic controls for F-106 aircraft.

Sperry Gyroscope Co., Sperry Rand Corp., Long Island, N.Y.—$432,693 AMC contract for navigational radar components for B-47, KC-135A and B-52G aircraft.

General Precision Laboratory, Inc., Pleasantville, N.Y.—$1,155,351 AMC contract for components of AN/APN-81 airborne navigation system for B-52, KC-135 and RB-66 aircraft.

Airborne Fire Detection Equipment:

Walter Kidde & Co., Inc., Belleville, N.J.—$73,593 Aviation Supply Office contract for elements used in fire detection systems for A3D aircraft.

Aircraft:

Vertol Aircraft Corp., Morton, Pa.—$300,000 AMC contract for model 44A helicopters, spares, ground support equipment and handbooks.

Kaman Aircraft Corp., Bloomfield, Conn.—$10,248,758 AMC contract for H-43B helicopters, spares, GHE, handbooks and technical data.

Douglas Aircraft Corp., El Segundo, Calif.—$79 million Navy contract for A4D-2N aircraft.

Beech Aircraft Corp., Wichita, Kan.—$2 million Army follow-on contract for L-23 aircraft.

Aircraft Components:

Bendix Products Div., Bendix Aviation Corp., South Bend, Ind.—$400,000 AMC contract for brake assemblies for B-52G aircraft.

Longren Aircraft Co., Torrance, Calif.—$550,000 Boeing Airplane Co. contract for KC-135 inspar ribs.

Aircraft Parts:

Lockheed Aircraft Corp., Burbank Calif.—$54,636 Aviation Supply Office contract for quick-change nose units and side panels and structural airframe spare parts for P2V aircraft.

Aircraft Modification:

Fairchild Engine & Airplane Corp., Hagerstown, Md.—Olmstead Air Force contract for modification of C-119 aircraft.

Aviation Fuel:

Aurora Gasoline Co., Detroit, Mich.—$38,500 Military Petroleum Agency contract for 350,000 gallons of JP4.

The Pure Oil Co., Chicago, Ill.—$57,000 Military Petroleum Agency contract for 600,000 gallons of jet fuel.

Shell Oil Co., New York, N.Y.—$47,430 Military Petroleum Agency contract for 450,000 gallons of JP4.

Standard Oil Co. (Indiana), Chicago, Ill.—$113,850 Military Petroleum Agency contract for 1,150,000 gallons of JP4.

Grand Central Aircraft Co., Glendale 1, Calif.—$42,204 Military Petroleum Supply Agency contract for 168,000 gallons 100/130 aviation gasoline and 1,800 gallons of lubricating oil 1100.

Engines:

Pratt & Whitney Aircraft Div. of United Aircraft Corp., Hartford, Conn.—$20 million joint Air Force-Navy contract for production of J75 jet engines.

General Electric Co., Lynn, Mass.—$1.1 million joint Air Force-Navy contract for preproduction and special tooling for J85 engine.

Engine Parts:

Continental Motors Corp., Aircraft Engine Div., Muskegon, Mich.—$423,760 Memphis Air Materiel contract for misc. replacement spare parts applicable to Continental Packette engines.

Ground Electronics:

Aircraft Armaments, Inc.—$2,951,920 contract from Civil Aeronautics Administration for development of an electronic air traffic control simulator system for use at CAA's Technical Development Center, Indianapolis, Ind.

Instruments:

Mergenthaler Linotype Co., Brooklyn, N.Y.—$61,035 AMC contract for pressure transducers for F-101A and F-101C aircraft.

Maintenance and Overhaul:

Hamilton Standard Div. of United Aircraft Corp., Windsor Locks, Conn.—$175,621 Oklahoma City Air Materiel contract for overhaul, repair and test of turbine assemblies.

Woodward Governor Co., Rockford, Ill.—$309,184 Memphis Air Materiel contract for repair, rework, overhaul and modification of class 2990 centrifugal type engine governors.

Vickers, Inc., Detroit 32, Mich.—$74,250 Aviation Supply Office contract for services and materials necessary to overhaul, repair and modify hydraulic pumps for F8U aircraft.

Boeing Airplane Co., Wichita, Kan.—$2,227,000 Oklahoma City Air Materiel contract for structural survey program on B-52 aircraft models A thru F.

Pesco Products Div., Borg Warner Corp., Bedford, O.—$30,523 Aviation Supply Office contract for overhaul kits to support pumps for J57-P16 aircraft engines.

General Electric Co., Cincinnati, O.—$6,448,500 Oklahoma Air Materiel contract for overhaul of J47-GE-25/25A turbojet engines.

Scintilla Div., Bendix Aviation Corp., Sidney, N.Y.—$33,442 Aviation Supply contract for wiring harnesses for use on J65 aircraft engine ignitions.

Propeller Components:

United Aircraft Corp., Hamilton Standard Div., Windsor Locks, Conn.—$28,677 AMC contract for propeller synchrophasers for C-130B aircraft.

Service Air Test Equipment:

The Aeroflex Corp., Aeroflex Laboratories Div., Long Island City, N.Y.—$264,095 AMC contract for photogrammatic vertical reference system.

Weapons Systems:

American Machine & Foundry Co.—$1,350,000 Republic Aviation Corp. contract for bomb actuators for F-105 aircraft.

Miscellaneous:

The Reflectone Corp., Stanford, Conn.—$500,000 AMC contract for 13 gun-laying trainers with 11 MD-9 and 6 ASG-15 attachments.

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"Within and beyond lie many problems for our engineers: problems in aero and thermodynamic characteristics at supersonic speeds, in radar, in optics, in infrared and data processing for airborne detection systems. Additional long-range problems exist in military systems analysis, nuclear and space craft systems, commercial air transport studies, and industrial operations research.

"There are openings now for thoroughly qualified electronics and aero-thermodynamics engineers and operations research specialists.

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AIRTRENDS

A new short take-off and landing interceptor aircraft will be developed jointly by the Navy and the Air Force. Navy is executive agent with AF footing part of the bill. The project will be kept under wraps until next spring when the Bell X-14 is expected to fly. The X-14 will be the basis for the new interceptor, according to current plans. A tactical fighter-bomber may be a later development from the same research aircraft.

If Gen. Maxwell Taylor, Army Chief of Staff sells his five-year reorganization plan to the Pentagon and the Congress, there will be more money for new generations of Army aircraft. He wants $3 billion a year for five years for major procurement and production. This compares with an appropriation of $1.5 billion for major procurement in fiscal 1959 and no new money for the years between the end of the Korean War and the start of the current fiscal year.

Latest test of airlift capability may well be a new airlift into Berlin. Military Air Transport Service is readying its planes and crews to handle whatever crisis may develop as a result of current Soviet threats. Lt. Gen. William H. Tunner, commander of the first Berlin airlift, as MATS commander, can be expected to put his experience to work and will undoubtedly call on the airlines for augmentation if need be.

Some idea of the magnitude of the operation which would be required can be obtained from First Berlin Airlift statistics. During the latter days of the lift planes made as many as 900 trips per day, using for the most part DC-4 aircraft. The job would be eased by the current availability of C-133s and C-124s, according to Gen. Tunner.

Battle between scientists and military types can be expected to break out over the nuclear powered aircraft. It is the thesis of the military experts and of the production people that you sometimes can research a project to death and that the search for new high temperature materials has reached a point where design techniques and production know-how can justify the start of a hardware program.

Odds are better than even that Russia may put an atomic-powered plane in the air before the U.S. does. Big delta-wing plane Russia is now flying could be a prototype or test bed.

Little publicized fact about last year's record KC-135 flight by Gen. Curtis LeMay to Buenos Aires: A few hours before takeoff, one of the ground crew carelessly let his hat get too close to the intake of one of the KC-135's J57 jets. Result: A quick, but expensive and avoidable, engine change.

Air Force will revise the list of its membership of the Scientific Advisory Board which acts as a consultant to Gen. Thomas White, AF Chief of Staff. New chairman is Lt. Gen. Donald L. Putt (USAF ret.), long time expert in AF research and development projects.

Height of the Ridiculous Award should go to Defense security officials who persist in classifying equipment such as small jet engines just for the sake of a "uniform" security policy. In periods of limited budgets such as at present, this practice only tends to hamper commercial sales, penalize industry and contribute absolutely nothing to national security.

Directorate of Logistics Support Management will be established by the Air Materiel Command in each of its nine Air Materiel Areas, shortly after Jan. 1, 1959 (see p. 18). Major divisions of each new directorate will be Weapon System; Commodity; and Service. The new directorates will not change the job of providing normal base support required by field activities.

Look for a real effort to revive the CF-105 Arrow by Canada. It would still like support from the U.S. on the basis of the performance of the aircraft under test. Indications are that there is more than a little Canadian dissatisfaction with the current North American Air Defense program and the refusal of the U.S. to buy Canadian designed combat-type aircraft.

AIRTRENDS

All Century Series fighters will be equipped with upward ejection seats now that the decision has been made to modify the Lockheed F-104s. Same seat will be used as those used in the original installation. Fabrication and necessary changes will be made by Lockheed. Catapults are government-furnished aircraft equipment and will be different from those in the original installation.

Complaints will climb over the growing tendency to ignore the need for continued aeronautical research not only to support military but commercial aviation progress. Gen. Orval R. Cook, president of Aircraft Industries Association (USAF, ret.), warned the manufacturers recently that the challenge of Soviet progress in the commercial field could not be ignored and a strong program of aeronautical research was essential at all levels.

Airborne digital computers will play an important role in target location both for aircraft and missiles. Potential is also being studied as a means of managing flight operations for large, long range jet aircraft.

An IBM code for classifying all accident and crash injury data has been developed by the Aviation Crash Injury Research, in Phoenix, under A. Howard Hasbrook. If used internationally, Hasbrook feels, all accident data now going "down the drain" could be used to advance future safety and reduce crash injuries. AVCir soon faces extinction due to withdrawal of military financial support.

Chemically-powered afterburners will be used on the manned nuclear-powered aircraft to permit speed and altitudes comparable with the engines using chemical fuels, if tests made in the laboratories prove out.

A chemical powder oil-leak detector already tested on aircraft engines will soon be marketed by Gilbreath Chemical Co., 383 Brannan St., San Francisco. Product will be called Cook's Oil Leak Detector.

Polyurethane, a new rubber substitute, is finding aircraft application as a solid tailwheel on Douglas F4D. Disogrin Industries, Inc., Mt. Vernon, N.Y., has sold the Navy 3,000 tailwheels, valued at $500,000. Disogrin has conducted numerous tests with both Douglas and the Navy, and the new material is reported to give five times the life of ordinary rubber. Other aircraft uses of Disogrin polyurethane include oxygen liner spheres, contact wheels (for turbine blade grinding machines), and inverter shock mounts under test for the Grumman Gulfstream.

A basic research breakthrough can be expected in fuel filtration soon. Shell Oil Co.—which is not about to get into the filter-separator business—has been working with manufacturers for three years to get an effective high-capacity unit. Trouble so far has been in getting the size down to the point where it will fit on existing refuelers. Also in the works is a fail-safe device to cut off fuel flow into aircraft when contamination reaches an unacceptable level. The small filter is some time away; the shut-off may be available next year.

A new testing rig is being developed by Cornell Aeronautical Laboratory for the Army to obtain performance and stability data for small rotorcraft at various forward speeds. Testing program is expected to start soon.

New Communication, Navigation Identification (CNI) developed by Collins Radio Company will be installed in the F-105, Chance-Vought F8U-3, McDonnell F4H and the North American A3J. The equipment is an integrated package. Single sideband for ground and airborne communications (SSB), also developed by Collins, is being used in both the airborne and ground communications network of SAC.

First Army aircraft scheduled to receive authorization for 100-hour inspections rather than the 50-hour periodic inspections now standard is the Sikorsky H-37 helicopter. Reliability of two-engine installation is said to be the reason.

HIGHEST PROFIT POTENTIAL EVER OFFERED

For most American carriers in the jet age, the new jet-prop Vickers Vanguard will offer a profit potential *at least 35% higher* than that offered by any comparable aircraft. With economy class seating, profits at present fares can be up to 70% higher.

The Vanguard is designed to give the greatest profit on those stage lengths most frequently flown—both domestic *and* international. It can serve the U.S.A.'s busiest air routes more economically than any other aircraft.

LOWEST OPERATING COSTS. Recent airline studies showed that Vanguard direct operating costs (based on a 139-seat configuration and compared with economy class configurations in other craft) will be lowest of all competitive airliners—jet or piston—on stages from 200-2000 miles. And because of its operational flexibility on many of these routes, the Vanguard may well offer the fastest schedules.

The Vanguard has many operational advantages. It presents no new A.T.C. problems or runway or noise handicaps. The large, well-balanced passenger/freight capacity makes it an off-peak money earner. Simultaneous on-and-off payload handling and over-all accessibility give extra-fast turn around. The proved reliability of Rolls-Royce jet-prop engines means top operating economy.

But above all, no other jet age airliner has been developed from nearly as extensive a backlog of actual airline experience as the Vanguard—backed by over 1½-million Viscount flying hours world-wide with over 30 airlines.

Fleets of 20 Vanguards each have already been ordered by TCA and BEA. For detailed figures and a cost analysis tailored to *your* operations, contact Christopher Clarkson, U.S. representative, 10 Rockefeller Plaza, New York 20, New York. Phone: CIrcle 7-3515.

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—LETTERS—

Too Old Too Soon

My connection with commercial aviation does not go beyond that of being a frequent fare-paying passenger. My interest, however, knows no bounds.

This leads to my desire to make several comments, which I hope might be of a constructive nature.

During this period of operating their present equipment prior to disposing of most of it when the new jets and turboprops go into service, the airlines would do well to look closely at their cabin interiors. Many of them are showing those signs of neglect that indicate a soon-to-be-terminated occupancy and use. I don't necessarily mean just the older DC-3s, but even the more recent DC-7s, the Connies and the Convairs. Often the maintenance needed is of a minor nature—such as broken or missing ashtrays . . . raveled, dirty curtains, worn or torn seat upholstery, P.A. systems that only crackle and gurgle, ventilators that do not close, etc.

Also, many of the airlines could take a closer look at the housekeeping. Particularly on those flights using equipment which I believe is classified as 'turnaround.' Often I have boarded these planes to find ashtrays crammed full, floors and seats littered.

Perhaps all the glamour will return when the new planes go into service, but in the meantime passengers are paying first class fares.

Stuart S. Tomber
Rio Syrup Company
St. Louis, Mo.

When & Where

DECEMBER

Dec. 2—Air Transport Assn. board of directors meeting, Washington, D.C.
Dec. 2-4—ARINC Airlines Electronic Engineering Committee, Hotel Statler, Washington, D.C.
Dec. 2-5—American Society of Mechanical Engineers, Aviation Division, annual meeting, Hotel Statler-Hilton, New York City.
Dec. 3—Air Transport Assn. annual membership meeting, Sheraton-Carlton, Washington, D.C.
Dec. 3—American Ordnance Assn. 40th annual industrial preparedness meeting, Waldorf-Astoria Hotel, New York City.
Dec. 7—Flight Engineers International Assn. anniversary banquet, New York City.
Dec. 16—Fourth Convertible Aircraft Congress, Franklin Institute, Philadelphia.
Dec. 16—Joint Industry-Army Aviation Symposium, sponsored by Aeronautical Training Society and The Aircraft Service Assn., Mayflower Hotel, Washington, D.C.
Dec. 17—The Aircraft Service Assn. annual meeting, Washington, D.C.
Dec. 17—Institute of the Aeronautical Sciences, Wright Memorial Dinner, Sheraton-Carlton, Washington, D.C.

JANUARY

Jan. 12-16—Society of Automotive Engineers annual meeting, Sheraton Cadillac and Hotel Statler, Detroit.
Jan. 26-29—IAS 27th annual meeting, Sheraton-Astor, New York City.
Jan. 27—Institute of the Aeronautical Sciences honors night dinner, Sheraton-Astor, New York City.

A matter of family interest

Pratt & Whitney Aircraft has a "family interest" in what happens to its engines throughout their many years of operation.

When a Pratt & Whitney Aircraft engine leaves our plant it's as good as we can make it. It's built to stay that way if properly serviced, using replacement parts that are exactly the same as original parts.

We are concerned over recent reports of increased use of bogus* replacement parts and the potential hazard they present to the dependable and efficient operation of aircraft engines. Counterfeit parts are difficult to detect. They may look genuine but they could cause trouble.

As the booklet "The Problem of Bogus Parts", published by Flight Safety Foundation, Inc., points out, "Another reason for serious concern is that the airworthiness certificate of your aircraft may be suspended or revoked if bogus parts are used in its repair, overhaul or maintenance."

Protect yourself against the problem of bogus parts by specifying original manufacturer's parts, and by dealing with authorized distributors or reputable overhaul or maintenance agencies. Don't take chances by buying your spare parts from a source which doesn't have a family interest in your engine.

**"The Problem of Bogus Parts," published by Flight Safety Foundation, Inc. A free copy of this informative booklet may be obtained by writing to Pratt & Whitney Aircraft, East Hartford 8, Connecticut, Attention: Service Manager.*

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B.F.Goodrich engineers are working in many ways to help man break the bonds of earth—and return safely. Missile nose cones, improved solid fuels, propellant heaters, missile battery box heaters, instrument heaters, printed and etched circuits, stronger metal and plastic structural materials, insulating materials, precision rubber seals and gaskets, blind fasteners—these are only a few of the items that may help solve *your* space age problems. For specific R&D information, write B.F.Goodrich Aviation Products, a division of The B.F.Goodrich Company, Akron, Ohio.

B.F.Goodrich *aviation products*

Lockheed Bets $31 Million on JetStar

- **Company invested $11 million for two prototypes**
- **Another $20 million has been slated for production**
- **It has no big order, but gambles on small jet's appeal**

by **Joseph S. Murphy**
Executive Editor

Lockheed Aircraft Corp., in an unprecedented $31-million gamble, has launched its JetStar utility jet transport into production and its Georgia division into the commercial jet business.

Surely in dollars and seemingly in courage, the venture authorized by Lockheed's top-level policy committee on November 18 eclipses even Boeing's $15-million gamble that eventually led to a $1-billion-plus backlog for KC-135 tankers and 707 jet transports.

Initially, in an Air Force inspired "off the shelf" competition that had industry jockeying for position with paper projects, Robert E. Gross and company plunked down $11 million to build and fly two JetStar prototypes. The first of these took to the air 14 months ago after a "crash" 34-week construction program—discouraging all but McDonnell Aircraft Corp. from the UCX running.

• **Add $20 million**—But building prototypes is one risk and committing a plant to production without a big order on hand is another. And this latter step on the JetStar tags another $20 million to the stakes in Lockheed's big gamble.

At the same time, it adds Lockheed-Georgia Division to the roster of firms competing for commercial aircraft business both in the U.S. and abroad. Until now, the total output of the Marietta, Ga. facility has been confined to military C-130 turboprops for the U.S. and foreign governments.

With the JetStar, although the U.S. Air Force will have first call on production positions, Lockheed is eyeing a lucrative commercial market. Today it holds reserved positions on some 70 commercial versions for executive use, some backed by cash deposits others not, and it's a good bet that this backstop market had more than a passing influence on signaling the go-ahead for production.

• **Air Force holds answer**—But regardless of how it fares commercially, the one potential customer that will spell the success or failure of Lockheed's gamble is the USAF.

Breakeven levels in small jet production run much higher than the 80 to 100 for models like the 707 or DC-8. At its price (below $1 million) it will take five, possibly six, JetStars to match the price tag of a single big jet and as many as 200 production orders before the breakeven point can be hurdled.

At some point along the line, Lockheed officials feel, an AF order must be garnered to make the project pay. Whether it be for utility jets or nav/bomb system trainers, Lockheed doesn't much care, but it wants the business and is giving the AF first rights to production aircraft to keep this prospect alive.

And if the gamble pays off, the future appears set for this single prime aircraft producer in the "deep" South. Although deliveries of C-130s will continue through mid-1960 to fill present orders, it is quite obvious that Hercules production won't last forever and the JetStar becomes the logical contender to keep the Georgia Division in business.

• **And the Hummingbird too**—Not that the small jet represents its only activity, however. In addition to its current bid for aircraft nuclear development work, Lockheed-Marietta has come up with a revolutionary new VTOL it hopes to market in large numbers to the USAF, Navy and Army.

The new development, called the Hummingbird, is proposed as a small (about 17-ft. wingspan) design that can be launched and retrieved in flight by the C-130. It could descend vertically and hover at water level for air-sea rescue missions, then take off vertically and cruise at 375 knots to return to its "mother" C-130.

Identified as Lockheed project GL-224, the Hummingbird has reached the testbed stage and has hovered on a tethered rig at Marietta with two Fairchild J44s as powerplants.

Although first concepts of the Hummingbird (disclosed in a Lockheed brochure directed at USAF Air Rescue Service missions) pictured it with a cockpit in the aft part of the fuselage (see sketch), it is understood that more recent design proposals have restored it to a more conventional location.

Also, the powerplant installation has been revised to call for two side-mounted jets with a new approach involving a flapper valve and slotted exhaust used to gain exceedingly high efficiencies in vertical flight.

AFTER THE JETSTAR, Hummingbird is bright prospect for Lockheed-Marietta.

Before Trouble Starts

Dynamic tests on aircraft to prevent problems later

Preventive medicine for aircraft is the new policy of the Air Force for all first line aircraft. Leaning heavily on the lessons learned when the B-47 started breaking up early this year, Air Force has a new program which it hopes will highlight trouble before it occurs.

First contract—for $2,227,000—in the new program has been awarded to Boeing Airplane Co., Wichita, to make "structural surveys of the B-52A-F, intercontinental bombers. Planes will be flown in specific profiles to get gust loadings and other conditions encountered in flight.

These conditions will then be duplicated in "cyclic" or "dynamic" tests in which the test planes will be setup in jigs and flight conditions repeated over and over again until potential weak points show up. This, Air Force hopes, will provide information as to when the aircraft ought to be brought in for major overhaul and repair. In some cases, it would mean that the aircraft would be redlined to prevent flight beyond a specified number of hours without major inspection and overhaul.

B-52 is only the first of the airplanes which will be subjected to this type of testing. Plans call for similar tests for all first line aircraft, according to Air Force sources.

AIA Hits Cost Rules

Group says DOD has "no excuse" for some refusals

When is a cost not a cost? How much of the cost of doing business should be allocated to a government contract? These and a host of other questions have been bothering the Pentagon and some 20,000 defense contractors for the last five years. And decisions hardly seem closer than they were five years ago.

Issue stems from the attempt of the Defense Department to draft a comprehensive set of cost principles which would apply across the procurement spectrum from cost reimbursement type contracts on one side to price analyses submitted with bids for firm fixed-price negotiated contracts, including termination or change order repricing claims.

A conference held October 15 between representatives of industry and the DOD procurement specialists got nowhere. Result was a request by Assistant Defense Secretary Perkins McGuire (Supply and Logistics) that Aircraft Industries Association amplify and further explain its position. This has now been done in a letter dated Nov. 7.

Basically, as AIA sees it, the long-drawn-out argument stems from the refusal of the Government to start from the proposition that "it is willing to accept any cost which has been incurred or accrued in good faith by a responsible contractor exercising its best management skills in the conduct of its business."

It can see no excuse for barring some 23 items of cost entirely or for disallowing 20 other items or for subjecting some 19 other items to special tests and reviews.

Costs creating the biggest headache at this time include: Advertising (now excluded completely); applied research; contributions and donations; interest; plant reconversion; rental; civil defense; contingencies; depreciation; excess facilities; insurance and indemnification; financing costs other than interest; maintenance and repair; organization; patent; professional services; royalty; recruiting; selling; taxes; trade, business and professional activity; and certain specified termination costs.

AMC's Buying Setup for 1959

Reorganization of Air Materiel Command's Directorate of Procurement and Production and the creation of a new Aeronautical Systems Center becomes fully effective Jan. 15, 1959.

Objective is to separate the supervisory and policy making functions of the Directorate from operating responsibility.

Aeronautical Systems Center will be the new operating heart of AMC, for aircraft and supporting equipment, reporting directly to Gen. Edwin Rawlings, AMC chief. The new center is headed by Brig. Gen. Beverly H. Warren, who in addition to his responsibility for weapon systems project offices also will be responsible for the Aircraft Production Resources Agency, in which Army, Navy and Air Force all participate. AF representative is Col. W. R. Carter, Navy representative is Capt. E. L. Simpson and Army representative is Col. W. C. Hamill.

Four major subdivisions of the Aeronautical Systems Center providing necessary support and management are: Management Service Office headed by H. E. Walker; Contract Support Office headed by Col. A. W. James; logistics Support Office headed by Col. R. P. Gentry; and the Program and Analysis Office headed by J. A. O'Leary.

Because of the new effort to obtain better control of spares support and maintenance, Colonel Gentry's office is provided with an assistant for supply, Lt. Col. J. B. Erben, and an assistant for maintenance engineering, Lt. Col. H. P. Daly.

Major sections of the new center are listed below:

Commander: Brig. Gen. B. H. Warren
Deputy Commander: Col. M. D. Wilson
Assistant to the Commander: Mr. L. R. Koepnick
Executive: Lt. Col. C. H. Shambeck

Director of Strategic Systems: CHIEF—Col. L. F. Tanberg; DEPUTY—Mr. C. Stanley
- **B-70 WSPO:** CHIEF—Col. R. J. Meyer; DEPUTY—Mr. D. W. Lang
- **B-58 WSPO:** CHIEF—Col. D. D. Hutchens; DEPUTY—Mr. G. Oster
- **B-52 WSPO:** CHIEF—Col. S. A. Dallas; DEPUTY—Mr. D. J. Reagan
- **Advanced Nuclear WSPO:** CHIEF—Col. L. E. Symroski; DEPUTY—Mr. E. J. Jackson
- **Tanker WSPO:** CHIEF—Col. G. A. Leslie; DEPUTY—Mr. N. Silverston
- **Strategic Missiles WSPO:** CHIEF—Lt. Col. C. W. Tennant; DEPUTY—Mr. T. E. Shellabarger
- **GAM Missiles WSPO:** CHIEF—Col. H. W. Lanford, Jr.; DEPUTY—Mr. C. E. Jordan

Director of Air Defense Systems: CHIEF—Col. W. E. Chambers; DEPUTY—Mr. C. H. Nelson
- **F-106 WSPO:** CHIEF—Col. H. M. Harlow; DEPUTY—Mr. T. R. Sullivan
- **F-108 WSPO:** DEPUTY—Mr. P. J. Di Salvo
- **F-101 WSPO:** CHIEF—Col. R. A. Jaynes; DEPUTY—Mr. R. E. Keopp
- **Bomarc WSPO:** CHIEF—Col. F. E. Hignett; DEPUTY—Mr. J. D. Common
- **GAR Missiles WSPO:** CHIEF—Col. F. E. Oliver; DEPUTY—Mr. B. Sigmon
- **Drones WSPO:** CHIEF—Col. J. Beyer; DEPUTY—Mr. S. Garber
- **Electronic Support Sys. Div.:** CHIEF—Lt. Col. O. C. Mauldin; DEPUTY—Mr. A. D. Olson

Director of Tactical Systems: CHIEF—Col. J. S. Pirruccello; DEPUTY—Mr. L. L. Koch
- **F-105 WSPO:** CHIEF—Col. P. E. Hoeper; DEPUTY—Mr. E. W. Schuessler
- **F-104 WSPO:** CHIEF—Lt. Col. M. H. Culp; DEPUTY—Mr. B. B. Mishkind
- **Transport WSPO:** CHIEF—Col. P. J. Kuhl; DEPUTY—Mr. V. L. Whiter
- **Tactical Missiles WSPO:** CHIEF—Col. B. F. Kelly; DEPUTY—Mr. R. Akerd
- **Trainer WSPO:** CHIEF—Lt. Col. B. F. Herman; DEPUTY—Mr. W. Lankin
- **Helicopter Liaison WSPO:** CHIEF—Col. R. H. Cobb; DEPUTY—Mr. E. R. Goodlett

Director of Equipment & Services: CHIEF—Col. M. C. Smith; DEPUTY—Mr. W. B. Gould
- **Accessories Division:** CHIEF—Col. C. E. Tootle; DEPUTY—Mr. R. T. Lawrance
- **Comm. & Reconnaissance Division:** CHIEF—Col. E. McKaba; DEPUTY—Mr. K. G. Springen
- **Weapons Guidance Division:** CHIEF—Col. J. W. Skelton; DEPUTY—Mr. J. L. Wilson
- **Specialized Procurement Division:** CHIEF—Col. E. N. Odell
- **Propulsion Division:** CHIEF—Col. R. J. Disher; DEPUTY—Mr. C. A. Kochendorfer
- **GFAE Control Division:** CHIEF—Mr. R. H. Denning

Director of Resources: CHIEF—Col. W. R. Carter; DEPUTY—Mr. D. H. Filbert
- **Industrial Facilities Division:** CHIEF—Col. C. E. Moore; DEPUTY—Mr. E. Carrier
- **Manufacturing Methods Division:** CHIEF—Col. P. L. Hill; DEPUTY—Mr. J. Marsh
- **Material Control Division:** CHIEF—Col. J. B. McFarland; DEPUTY—Mr. W. J. Nolan

—AIR NEWS IN PICTURES—

U.S. Army Photos.

Shot Down in Frames?

Using motion picture film as ammunition, the dug-in infantryman at left fires his celluloid rounds at an F-100 (above) barreling in "on-the-deck" at more than 450 mph. It's part of an experiment being conducted by the U.S. Army Combat Development Center at Fort Ord, Calif., to determine the vulnerability of low-flying aircraft to ground fire. This and other phases of the program are helping to develop new concepts and to determine what could take place on nuclear battlefields.

Plastic Foot Warmer

Cabin floor supports for the Douglas DC-8 are constructed for reinforced plastic to prevent heat loss to the unheated baggage area below. The U-shaped supports are 1 in. wide, 1 in. deep and have ¾-in. flanges at the base. They are bonded to the main beams of the aircraft on 3-in. centers and serve as the supports for the aluminum floor.

Swedlow Plastics Co. Photo.

U.S. Navy Photo.

Another Version of a "Hot Rod"

Heinemann's Hot Rod—the Douglas A4D-2N Skyhawk—in its latest version is now a building at the El Segundo, Calif. plant of Douglas. The plane got its name because of the hard fight made by E. H. Heinemann, director of combat aircraft systems engineering for Douglas against the trend towards bigger, heavier and more complex aircraft. The plane is the Navy's lightest attack plane. Powered by a single Curtiss-Wright J65 engine, it travels at speeds in excess of 650 mph. Features of the latest version are: improved weather and navigation capability and in-flight refueling.

Aerial Jeep Power

Allison 250-hp turbines to be paired in Army vehicles

Allison's T63 250-hp turbine now under development for the Army may be used in a coupled installation to provide a 500-hp powerplant for future aerial jeeps, an Army official disclosed recently.

Addressing the Washington, D. C. section of the Society of Automotive Engineers, L. Hewin, chief of aviation of the Transportation Research & Engineering Command added that the $7,000 price tag quoted by Allison for the T63 might bring the jeep cost into the $25,000 to $30,000 bracket.

In an overall review of the jeep development program, Hewin said 21 different firms entered 27 different proposals before the Army selected the trio of Chrysler, Piasecki and Aerophysics Development Corp. to build testbeds.

Specifications given these firms called for a jeep with a 25-knot speed, 25 nautical mile range, ability to be air-transportable in groups of four in a C-130 and about a 1,000 lb. payload. Empty weight ranges from 1,400 to 2,400 lbs.

Army planners have three basic missions for the jeeps, assuming their development proves successful. These include: (1) a transporter and gun-firing platform; (2) an electronics platform to overcome line-of-sight transmission obstacles; and (3) a general purpose utility vehicle.

Hewin gave these dimensions (length, width and height) for the models now being built. Aerophysics: 14.75′ x 14.75′ x 3.75′ (less windshield); Chrysler: 10′ x 22′ x 6.25′; Piasecki: 10.8′ x 24.5′ x 6.8′. The latter, he said, has completed about 25 hrs. of a scheduled 50-hour ground and hovering test and has demonstrated control characteristics similar to those of tandem rotor helicopters.

NASA Advisory Groups Cut; Heads Have to Be Named

National Aeronautics & Space Administration is streamlining its advisory committee structure. There will be 13 new research advisory committees in contrast to 28 such committees which worked with its predecessor, National Advisory Committee for Aeronautics.

Committees will work in the following fields: Fluid mechanics; aircraft aerodynamics; missile and space craft aerodynamics; control, guidance and navigation; chemical energy processes; nuclear energy processes; mechanical powerplant systems; electrical powerplant systems; structural loads; structural design; structural dynamics; materials; and aircraft operating problems.

A special committee on life sciences will be headed by Dr. W. Randolph Lovelace II.

Committees will review research in progress, recommend problems which ought to be investigated and assist in the formulation and coordination of NASA research. All members of the committees will be named on the basis of their professional capacities as individuals rather than by virtue of any position which they may hold. Names of the chairmen of the committees will be announced before the first of next year.

Here's What AIA Pondered At Phoenix Board Meeting

A proposal to set up a new Flight Operations Safety Committee to work with the military and Federal Aviation Agency appeared on the agenda for the first time as Aircraft Industries Association held its semiannual board meeting in Phoenix.

On an agenda dominated by such key issues as renegotiation, procurement rules, progress payments, etc., the AIA board also considered a proposed amendment to the Civil Aeronautics Act to provide for easier financing of the purchasing of turboprop aircraft. No details of AIA action on these two proposals were available at presstime.

GE Rates Its Suppliers For Three Small Turbines

A new mechanized purchasing system now in operation by General Electric's Small Aircraft Engine Department permits it for the first time to rate the quality of its suppliers in three categories—acceptable, marginal and unsatisfactory.

In operation for the past eight months, the mechanized installation makes use of IBM methods combined with New England Tel. & Tel. punched-tape teletype to speed the flow of procurement information within its plant. GE estimates that its adoption will save some $219,000 in 1958 alone in dealing with subcontractors who supply about 65% of the 3,600 parts used in its T58, T64 and J85 turbine engines.

Doman's Whippet is Low-Cost Lightweight

Doman Helicopters, Inc., armed with a brighter financial outlook made possible by Dalto simulator business, is building the prototype of a new four-place helicopter it hopes to market for $18,500.

The Doman "Whippet," a 1,940 lb. gross, 132-mph lightweight helicopter would have a cost per seat mile of 6.5 cents or one-fourth that of current small helicopters, according to Glidden S. Doman, company president.

Doman told AMERICAN AVIATION that present plans call for prototype first flight sometime next year. Delivery is being quoted within two years in a market survey now being conducted among prospective customers.

Doman said the large reduction in both sales price and operating cost is due to a combination of the Doman enclosed rotor system with ejector engine cooling and other weight saving features. Basic design is a development of the company's LZ-5 helicopter.

Powerplant for the Whippet is a Lycoming VO-360, four cylinder, 180 hp piston engine which will drive a three-bladed main rotor. Empty weight will be 930 lbs. and best range speed at 1,780 lbs. gross will be 103 mph.

The Doman design will have a 1,500-fpm rate of climb, 6,300-ft. service ceiling and 206-mile range with a 15-minute fuel reserve.

Doman estimates of operating cost are based on 1,000 hr. annual utilization, a total direct operating cost of $19.37 per hour, $.0645 per seat-mile or $.77 per ton-mile.

. . . News Briefs

• **Big spare parts contract**—Westinghouse Aviation Gas Turbine Division received its largest jet engine spare parts contract in more than four years, a $5,946,563 Navy order for J34-WE-46 parts to support North American T2J trainer. Shipments are slated to begin next spring.

• **JetStar deliveries**—Lockheed-Georgia Division is quoting August 1960 delivery of JetStars powered by two Bristol-Orpheus engines, August 1961 for those fitted with General Electric J85s or Pratt & Whitney JT-12s (See p. 17). Negotiations also are under way with Bristol-Canada for possible production of JetStar in Canada or as an alternative, major manufacture of systems by Bristol at Winnepeg.

• **New process acquired**—Grumman Aircraft Engineering Corp. and Twin Coach Co. have secured rights to new "quartz lamp" process developed by Armour Research Foundation for manufacture of airframes for supersonic aircraft.

• **X-18 due**—Rollout of Hiller X-18 VTOL/STOL tilt-wing transport testbed is due at Palo Alto, Calif. on Dec. 8.

• **Computer for NAA**—First of the new bigger and more powerful IBM 709 computers for a southern California aircraft company is now being set up at North American Aviation for use by its engineering departments. This is the second 709 delivered on the West Coast.

• **Names in the news**—New temporary Air Force brig. generals: Col. E. B. LeBailley, deputy director of Office of Information Services; R. C. Ruegg, director of procurement and production; Ben. G. Holzman, commander of Office of Scientific Research; Norman L. Peterson, deputy commander Air Weather Service, MATS; Charles E. Jung, deputy commander of Oklahoma City Air Materiel Area; Loren C. McCollom, deputy chief of programs, Air Defense Development, ARDC; and J. T. Kingsley, Jr., chief of staff, Air Materiel Command.

• **Fuel injected Lycoming**—Said to be the highest rated fuel injection engine in the U.S. for business aircraft, new IGSO-480-A1A6 by Lycoming Div. of Avco Mfg. Co. is rated at 340 hp for takeoff and uses 100/130 octane grade fuel. It is a development of the carbureted GSO-480 and is equipped with a Simmonds Type 570 fuel injector.

DEFENSE ANGLES

By Betty Oswald

"Camel" is now being spelled with two "a's" in the Pentagon, by officers and scientists in the know. "Camal" is the code name for "continuous airborne missile-launch and low-level penetration." This is Pentagonese for the latest requirement for a nuclear-powered aircraft. In lay language, it represents the new operational requirement for an airborne alert system, which like the proverbial camel, would carry a big payload, remain in the air for long periods and, in the event of trouble, provide an instantaneous reaction. Air-launched missiles carried by "Camal" would knock out targets which are insufficiently identified to permit the use of surface-to-surface missiles. Both Convair Division of General Dynamics and Lockheed Aircraft have submitted proposals.

• **SeaMistress and SeaMaster**—Lack of money also can be the root of all evil. Latest victim of the dollar squeeze is the Martin Company. It lost 10 aircraft out of a total of 24 P6M SeaMasters on order from the Navy. Bad luck in losing the first two aircraft, and the necessity for making expensive fixes with all of the attendant delays, played an important part in the decision. Martin now has six planes flying. It would like to recoup with a transport version dubbed SeaMistress, in which the Army is interested. Question is whether the Army is interested enough to spend scarce dollars to prove out the efficiency of this type of airlift. Navy will renegotiate a $114.5 million production order.

• **The Berlin crisis**—A few Pentagon cynics who have been around for a long time are commenting on history's habit of repeating itself. They are watching with more than a little concern the developing crisis in Berlin now that Defense Secretary Neil McElroy has ordered the force levels reduced to the lowest point since the days just before Korea. Some are wondering more or less out loud whether Mr. McElroy, taking the cues from the White House, won't get blamed even as former Defense Secretary Louis Johnson was for the "false economy" of the months immediately preceding Korea.

• **Budget battle shapes**—Signs are already apparent that Congress and the White House will have a rough battle over the Defense Department budget due to go to Capitol Hill in mid-January. The White House is still reportedly insisting on the strictest kind of economy, keeping the desirable objective of balancing the budget uppermost in the last-minute negotiations. House Defense Appropriations Subcommittee Chairman George H. Mahon (D-Tex), on his return from a tour of Europe has made his own position clear—the budget must be increased substantially.

• **AIA leads R&D profit fight**—Aircraft Industries Association will take the lead in the fight for bigger profits to industry in the research and development program. This is considered particularly important, according to industry spokesmen, if the industry is to be asked, as expected, to do more independent research in the basic fields of aerodynamics, propulsion and the like. Argument is that the present allowable profit margin is too low to allow the investment in facilities and personnel, which industry says is required.

• **"Reno" pro and con**—Renegotiation question will find industry generally divided, when Capitol hearings start next year. Some groups headed by the National Association of Manufacturers want the law killed entirely. Others, headed by Aircraft Industries Association, recognize that this position may be politically impossible and are working to obtain a bill they can live with. This would include: judicial review of tax court cases and assurance that incentives will be provided to manufacturers to stimulate efficiency and economy. It is hoped that the present bone of contention between the Renegotiation Board and defense contractors over the handling of incentive-type contracts can thus be eliminated.

...NEWS IS HAPPENING AT NORTHROP

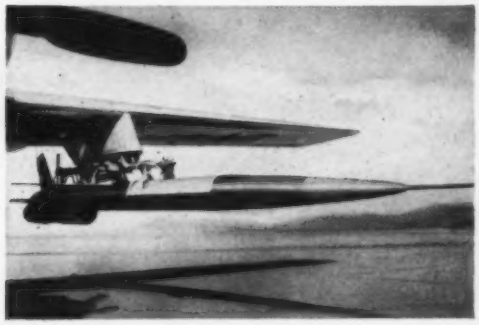
Northrop's supersonic twin-jet N-156F counterair fighter is designed to meet the need of NATO and SEATO nations... a high-performance weapon system that delivers more fighting power at less cost.

NEW NORTHROP FIGHTER BREAKS COST BARRIER!

N-156F WILL DELIVER MACH 2 DEFENSE AT LITTLE MORE THAN HALF THE COST OF FIGHTERS WITH COMPARABLE PERFORMANCE!

RADIOPLANE

Supersonic XQ-4 target: another advancement in a 20-year record of drone design and production for all of the U.S. Armed Forces.



NORTRONICS

Datico gives kill assurance, spares men and man-hours in speeding the vital pre-mission checkout of six proven U.S. missile systems.

NORTHROP DIVISION

Supersonic USAF T-38, first of Northrop's new N-156 aircraft family, will train space age airmen at minimum cost; is twin-jet safe.

INTERNATIONAL

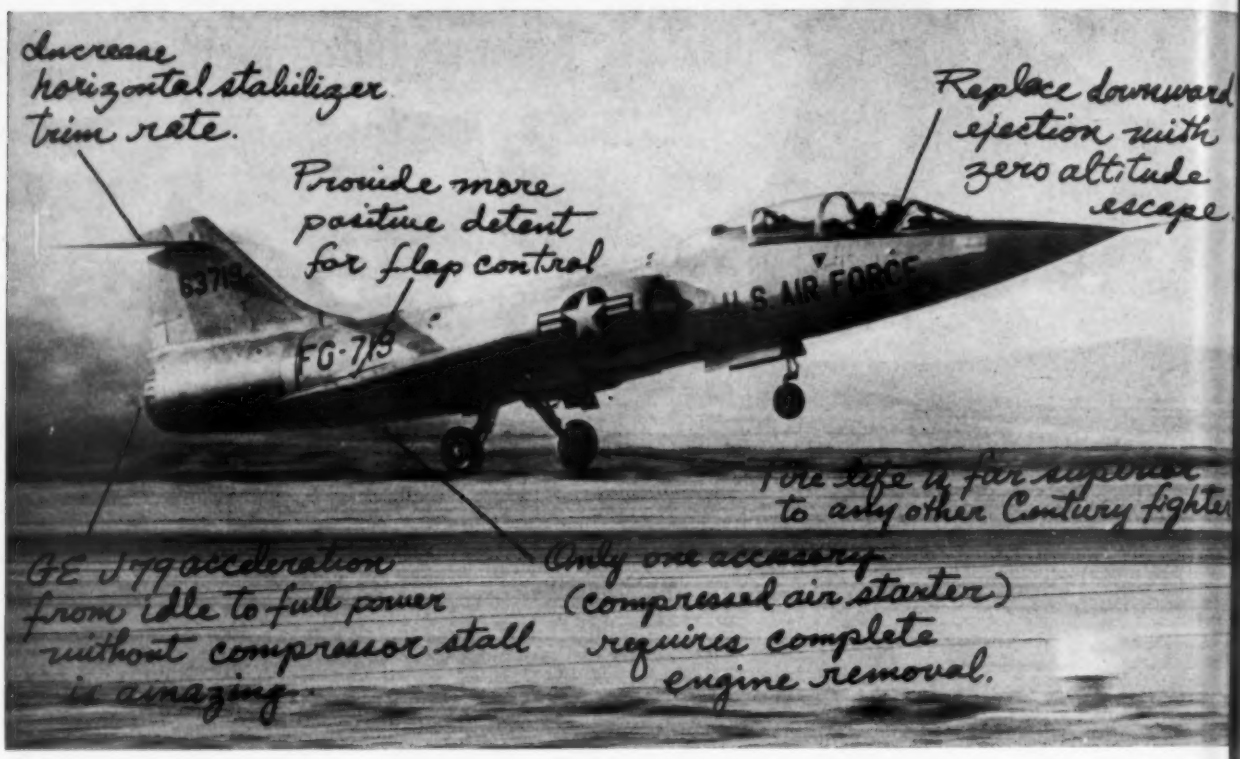
The new N-156F counterair fighter, now being built at Hawthorne, Calif., is proof of Northrop Aircraft's ability to create higher quality weapon systems at lower cost. This and other Northrop contributions to national and international defense are products of the Company's cost-minded management team and of Northrop-developed, years-ahead production techniques.

NORTHROP AIRCRAFT, INC.

Beverly Hills, California

Circle No. 10 on Reader Service Card.

ENGINEERING


Increase horizontal stabilizer trim rate.
Provide more positive detent for flap control
Replace downward ejection with zero altitude escape
U.S. AIR FORCE
FG-713
Tire life is far superior to any other Century fighter
GE J79 acceleration from idle to full power without compressor stall is amazing.
Only one accessory (compressed air starter) requires complete engine removal.

USAF Tabs F–104B "Ideal" Trainer

USAF Air Training Command, after a five-day evaluation of the Lockheed F-104B at Randolph AFB, Tex., dubbed the two-place version of the supersonic fighter as "ideally suited" to advanced trainer assignments.

An ATC report, based on the reaction of some 41 pilots on 58 flights, strongly endorsed not only the handling characteristics of the Mach 2 fighter, but also the improved maintainability of its airframe and General Electric J79 engines over other Century Series aircraft.

At the end of the accelerated "shakedown," Training Command pilots listed only three major deficiencies for correction before the Lockheed fighter would suit ATC needs:

1. Downward ejection must go; replace it with a "zero altitude" escape system.

2. Horizontal stabilizer trim rate is too slow. (Lockheed is correcting by 60% improvement in trim rate.)

3. Flap control is exposed to inadvertent movement to full "up" on go-arounds or touch-and-go landings. A more positive detent is needed.

Based on results of the evaluation, ATC recommended that the F-104B be considered favorably for three separate training roles—advanced fighter, interceptor and instrument pilot instruction. It recommended against its consideration in basic training as "asking too much" of a new and inexperienced student.

The ATC recommendations, which would broadly extend the production potential of the F-104 if adopted, now depend on future Tactical Air Command, USAFE and PACAF training needs.

During the flight evaluation, ATC pilots reported no problems operating from a 7,000 ft. runway although sometimes landing in 15 to 50 knot crosswinds. F-104 takeoff and landing distances were classed as generally less than those of a T-33 and considerably less than other Century Series models.

Only two tires were blown on landing, due to heavy braking at about 120 knots. One F-104B made about 51 touch-and-go or full stop landings before changing tires.

Of the total 39:30 hrs. flown by ATC, the average flight with tip tanks was 1 hr. 10 mins. and without tanks 30 mins. Some 18 of the clean flights (without tanks) involved a flight acceleration to the F-104B's maximum design speed of Mach 2.0.

In operating 58 flights, ATC reported no mechanical discrepancies on 29. In 62 turn-around maintenance operations between flights, the ground crew required a minimum of 10 mins., a maximum of 16 mins. and averaged 12.5 mins.

As to F-104B maintainability, ATC stressed the engine installation, noting that only one engine accessory (compressed air starter) requires removal of the engine for replacement. This was judged a major advance over other Century fighters which require engine removal for only minor replacements.

Regarding the J79 engine, ATC found that despite its design and maintenance innovations, it proved as easy, if not easier, to maintain as twin-spool axial flow types.

Pilots participating in the shakedown also were impressed by J79 performance. The final evaluation report labels engine acceleration, afterburner lightup and starting as outstanding. The J79's instant acceleration from idle to full power without compressor stall was reported as "amazing." ATC officials noted this as a great advantage in student operations where compressor stalls in other Century Series aircraft are considered quite common.

Flight Report: Decca–Dectra Navaids

Last month, AMERICAN AVIATION's Technical Editor, George Hart, flew as an observer on a British Ministry of Transport and Civil Aviation evaluation of Decca and Dectra, British-built short- and long-range navigation aids. He flew in the cockpit to watch Decca's operation in scheduled airline service with British European Airways and Silver City Airways in the U.K., and flew it himself in The Decca Navigator Co.'s plane.

By George Hart
Technical Editor

From the time the de Havilland Comet 1A swung onto the runway at Gander, Nfld., and surged into the air en route to England, the Decca/Dectra feature which struck me as being most impressive was the pictorial display on the pilot's instrument panel. Instantly matching the slightest change in position of the speedy jet transport, a stylus inked a line on a chart located on the instrument panel.

By keeping this line on the required track, already drawn on the chart, the plane's commander, veteran test pilot and retired RAF Group Captain, H. (Bruin) Purvis, flew precisely from check point to check point in the Gander clearance pattern assigned to him. This pictorial display, or flight log, enabled us to view our progress clearly, and fly a true Great Circle, rather than a series of rhumb lines, across the Atlantic. Drift and ground speed could be checked with ease, and holding patterns flown with extreme accuracy.

This, incidentally, was not just a matter of Purvis' know-how. Later, I was given an opportunity to fly the Decca system in England and, though absolutely inexperienced in its use, soon found little difficulty in adjusting to this navigation system. Once one becomes accustomed to Decca's sensitivity, and remembers not to try to "fly" the stylus but to use it as a reference (as with flying a localizer and glide path), it doesn't take long to catch on.

Decca, invented by an American, W. J. (Bill) O'Brien, was developed and put into production by the Decca Navigator Co., Ltd. of England. In the U.S., manufacturing rights are held by Bendix Aviation Corp.'s Pacific Div. It is a low-frequency (70-130 kc. band) radio-positioning navigation system based on hyperbolic patterns set up by pairs of ground transmitters located some 70 mi. apart. Its range is given as at least 250 mi., and its accuracy is measured in mere yards. A Decca chain consists of a master ground station set in the middle of three slave stations forming an equilateral triangle.

The Dectra ground station setup is much the same as that used for Decca, but it's more powerful; its range is more than 2,000 mi. The Dectra installation covering the North Atlantic also forms part of the Newfoundland Decca chain. This chain is oriented so that the hyperbolic pattern formed by the master and one slave embraces a base line extending from Gander to a point

DECCA/DECTRA FLIGHT LOG leaves Comet IV panel uncluttered.

in the vicinity of Prestwick, Scotland, to give tracking information. In Scotland, transmissions from a ranging station complete the positioning grid. Dectra accuracy is reported as five nautical miles even at the fringes of its coverage. This figure includes sky wave error, since Dectra makes use of the sky wave for its long range.

Positioning information is displayed on cockpit instruments called Decometers, each calling out the aircraft's position in a specific master/slave pattern. However, the Decca people realized that fast-moving planes should be equipped with some sort of display which would give the pilot a continuous picture of his whereabouts, particularly in congested traffic areas. So they fed the readings through a computer to activate a flight log.

(Continued on page 26)

DECCA DESIGN FOR THE U.S.

Decca engineers estimate 30 Decca chains would cover the U.S. for a total cost of $30 million. As shown here, transmitters in chains at New York, Wichita and Los Angeles or San Francisco could be used to establish Dectra patterns for transcontinental "Super Airways." Dectra accuracy would vary from two to four nautical miles as indicated. Cost of airborne equipment, in a production run, is quoted as running from $800 for the Bendix-Decca lightweight installation, to $6,000 for the latest Decca Mk.10, and $9,000 for the Decca/Dectra combination.

. . . Flight report: Decca-Dectra navaids

British European Airways Corp. has used Decca for a number of years. One BEA captain told me that, at first, there was considerable objection to the system, as there often is with anything new. Now, it is used by all the pilots, and only about 20% have any reservations as to its usefulness. However, this captain pointed out, it is not considered a primary aid any more than is any other piece of navigation equipment in the aircraft. Each one is checked against the other as the trip progresses. "You add an aid to increase efficiency and safety in the air. Within reason, you don't remove an aid just because some improved piece of equipment has come along."

• **Flying the Channel**—One of the most significant Decca installations is that of Silver City Airways, Ltd., one of Britain's few independent operators. Silver City runs a passenger and automobile ferry service between England and France (A/A Sept. 22, p. 57). Originally, the company installed Decca because there were no aids at the airports on the routes being used. Now, GCA and other aids are available; however, the airline still uses Decca because it more than pays for itself. At peak season, a flight takes off every two minutes on the average 30-mile hop across the English Channel. Silver City has found that as much as three minutes can be saved on each flight due to accuracy with which the route may be flown, and simplification of traffic patterns at each end.

MTCA is not alone in evaluation of the two British aids. Airways Modernization Board is running Decca tests under contract with New York Airways to determine the value of a low-frequency area coverage system for helicopter navigation under adverse weather conditions.

Airlines which have conducted, and are conducting, Decca/Dectra tests include Pan American World Airways, Trans-Canada Air Lines, Scandinavian Airlines System, Swissair, and British Overseas Airways. Aircraft involved include Boeing 377s, Douglas DC-7s, de Havilland Comets, Vickers Valiant jet bombers, Lockheed Super Constellations, Vertol 44B and Bell 47-H helicopters.

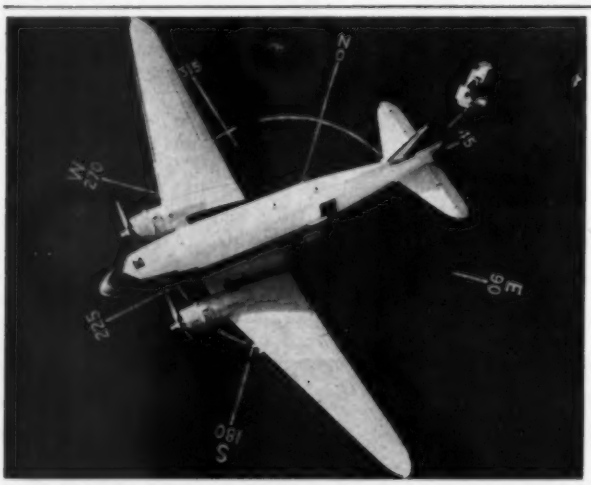
• **Reliability good**—Both Decca and Dectra are credited with being highly reliable. Ground stations are equipped with devices which switch automatically to spare transmitters, power supplies, etc. to cope with almost any eventuality short of destruction of masts or complete installations.

A PAA report states:

"The accuracy of Dectra was found superior to the standard navigational systems against which it was checked. The system was found to be almost unaffected by precipitation static and continued to function when all other radio reception was swamped out."

• **Ground station siting**—The siting of Decca ground stations is a comparatively simple matter, and flight calibration is not required. In this respect, it's interesting to note that less than five hours after the New York chain was switched on for the first time, it was used by a British Overseas Airways Corp. DC-7 threading its way in for a landing at Idlewild. Another advantage of both Decca and Dectra is that great flexibility may be exercised in establishment of airways and traffic control procedures.

In view of the technical attributes of Decca and Dectra, and the extensive use already made of these systems, the British government is pressing for their adoption as standard, international navigation aids.



TIME-CONSUMING METHOD of swinging a compass by positioning the aircraft on a compass rose may be replaced by . . .

. . . NEW SPERRY GYROSCOPE CO. system which electronically rotates equivalent of earth's magnetic field about the aircraft.

Sperry Spins the Compass—Not the Plane

A new method of swinging an aircraft compass has been developed by Sperry Gyroscope Co. for the U.S. Air Force. This system is designed to electronically rotate the earth's magnetic field around the plane, thus eliminating the need for a compass rose which, because it must be surveyed precisely and located far from sources of magnetic disturbance, may cost as much as $250,000 to construct.

By "walling off" the natural magnetic field, and introducing an artificial field, the system is used to make the aircraft's compass take up any desired heading.

A technician then may check and compensate for indicating errors in all directions in the normal manner. Consequently, a job which used to take as much as an entire working day to accomplish, now may be completed within a couple of hours, the company says.

Jet Hydraulics

Jet talks dominate Eighth Annual Vickers Conference

By Bill Combs
Engineering Editor

DETROIT, MICH.—The annual Vickers Aircraft Hydraulics Conference, heretofore predominantly a piston transport technical discussion, moved into the jet age.

Before a record attendance (nearly 200) for the eighth annual session, representatives of Boeing, Convair, and Lockheed disclosed first complete details of systems designed into the 707, 880, and Electra, respectively.

Initially Boeing had offered its 707 customers a choice of Skydrol 500 or MIL-0-5606 hydraulic oil, with airline operators' preference evenly divided between the two. After further study, however, Boeing has chosen to use Skydrol exclusively.

Both the 707 and Electra use hydraulic pressures of 3,000 psi. The hydraulic system in the 880 is divided into three subsystems, with the high-pressure system working at approximately 2,900 psi. The medium and low-pressure systems have pressures of 70 and 40 psi, respectively.

Hydraulic systems of all three airplanes are based on the concept of dual systems. In event of failure of one, the other system will provide at least partial operation.

Emergency operation of the flaps and spoilers in the 880 is provided by the secondary system, which gives partial travel depending on air load. In the 707, Boeing uses electric actuators for emergency flap operation. Under normal conditions, the flap requires 30 sec. for extension and retraction, but in the emergency condition 3 min. is needed.

Lockheed has provided new ease of maintenance by locating major components of its hydraulic system in one area. This area is aft of the wing box, beneath the cabin floor. Called the "service center," the compartment also houses the electrically driven hydraulic pumps, thus removing all pressurized hydraulic oil from the engine fire zones.

On Electras and 707's with self-contained starting systems, the starting bottles are charged by compressors driven by hydraulic motors.

——How They Use Hydraulics——

	707	880	Electra
Landing Gear	yes	yes	yes
Flaps	yes	yes	yes
Spoilers & Slats	yes	yes	..
Windshield Wipers	no	yes	yes
Control Boost	yes*	no	yes
Wheel Brakes	yes	yes	yes
Steering	yes**	yes**	yes**
Braking During Gear Retraction	yes	yes	yesx

* Rudder power control on some models
** Nose wheel steering
x Manually accomplished by pilot under reduced pressure

Power Systems With No Moving Parts Predicted

Airborne power systems with no moving parts and the elimination of constant speed drives have been predicted by Gerald J. Widawsky, president of Electrosolids Corp., at the dedication of new company facilities at Panorama City, Calif.

The no-moving-parts electrical system will be built around a "fuel cell" (probably a development of the thermopile principle) that converts fuel directly into electrical energy. Such a device may soon be marketed, Widawsky added.

If the cell can produce efficiencies of 60% to 80%, it can be used with inverters and other power equipment to eliminate all moving parts in electrical systems, he said.

Constant speed drives may be eliminated by solid state equipment with regulation characteristics which will allow the alternator to be connected directly to an engine. Widawsky added that his company is now developing such a system.

Electrosolids' principal products, silicon transformer-rectifiers, are used on North American's X-15, Martin P6M, Douglas B-66, Grumman WF-2, and other aircraft. A second major product line, transistorized static inverters, is used on the Boeing B-52, Republic F-105, Lockheed F-104, Convair B-58, and the Polaris and Atlas missiles.

Douglas Reports Savings Through Use of Mockups

The advantages of development testing and simulated flight testing at ground static conditions were illustrated by the experience of the Douglas Aircraft Co. in producing the air-conditioning system for the cockpit of the DC-8.

The original system looked good on paper, but tests in the sectional mockup brought out the need for the larger quantities of air per unit volume to remove the high electronic heat loads of the 7,500 watt cockpit.

Had production proceeded with the paper design, costly delays would have resulted. By using a thermal test cockpit, the changes in the distribution system were made before production was started.

According to A. A. Hershfield—Douglas air-conditioning system design engineer—final checks on all air-conditioning systems should be made in sectional mockups to cut change costs.

Different environmental and physical conditions in the cockpit and the passenger compartments make it advisable to put two independent air-conditioning systems in the new jetliners. Douglas therefore constructed two test sections, a nose and a portion of fuselage, and conducted controlled tests of each. Both sections were placed in a chamber which could maintain either very high or very low temperatures to simulate the climatic conditions they might encounter in service.

Copter Speeds of 200 mph Is Goal of Rotor Research

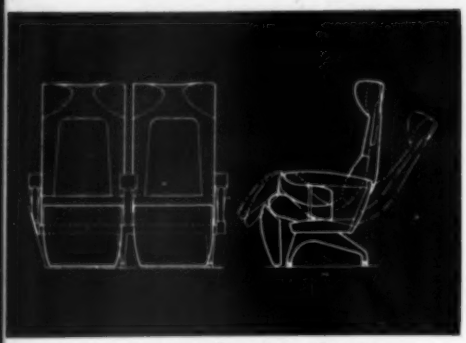
Research studies for the purpose of determining the optimum rotor geometry for high-speed helicopters have been initiated by Kellett Aircraft Corp. under contract with BuAer. If successful, these studies may result in a new breed of helicopters capable of speeds in excess of 200 mph.

Present day rotor systems are limited in their high-speed potentials, because increased helicopter speed decreases the relative speed of the blade on the retreating side, leading to stall conditions. The rotor speed is limited by the problem of compressibility on the advancing side.

. . . Engineering Briefs

• **Mach 3 hydraulics**—W. Bobier, chief Engineer, Detroit Vickers Inc., says studies are being made of hydraulic system requirements for Mach 3 transport aircraft. The fluid power system will need to be larger than presently used, and must be able to sustain a continuous temperature of over 500F. Hydraulics may also be used to provide the vast amounts of cooling and refrigeration necessary in the passenger and crew compartments, Bobier said.

• **Anti-collision device**—Maj. Gen. J. D. Caldara, chief of USAF flight safety research, says the Air Force is conducting tests at Edwards AFB of a new anti-collision device. This device provides full coverage, and transmits intelligence in terms of time. It is a mutual system—requiring a unit in both approaching aircraft. Total weight is less than 50 lbs., and the cost is in the $1,000-$2,000 range. First production will be early next year.



Euphorian Seat

NaVan Products, subsidiary of North American Aviation, has developed a new style passenger seat. Called the "Euphorian" (Greek for "complete relaxation") seat, the manufacturer says it supports the body more restfully than conventional "square" seats. It is available in several models, for both airline and business aircraft.

Circle No. 158 on Reader Service Card.

Emergency Light

Bekon emergency runway lights, manufactured by Sta-Parts Co., Ft. Worth, provide a handy, economical method to eliminate diversion of air traffic during power failure. Adaptable to 110v, the Bekon is normally powered by six-volt battery. Canvas bag is loaded with ballast and can be staked to prevent overturn. Colored lenses are available.

Circle No. 159 on Reader Service Card.

Airborne Magnetic Flight Recorder

Emerson Radio and Phonograph Corp., under USAF contract, will begin production in January of a new 20 lb. airborne magnetic flight recorder.

Called Model No. ERP-7420, the recorder is designed to last the life of the airplane, and can provide information on such parameters as structural stress, airspeed, angle of attack, yaw, acceleration and engine rpm.

Although first units will go to AF and Navy, the airlines are also interested. American, Eastern, TWA, and United will get recorders to service test against a CAB requirement that all aircraft operating above 25,000 ft. have them.

Using no vacuum tubes, transistors, or magnetic amplifiers, the device makes possible the direct recording and playback of d-c signals without amplitude, frequency or other modulation. It uses gyros to initiate d-c signals, with a transducer located at the pitot line connection.

Data collected by the recorder is fed to a computer which provides analysis. Using 1 in. tape, this model provides nine channels; and, Emerson says, up to 15 channels can be obtained by varying the tape width.

Monitoring the power supply for automatic calibration of recorded information, data can be presented in analog or digital form, and can be stored on magnetic tape or in punched card form.

The unit is designed to military specifications for vibration, and can take 20g accelerations in any direction. It's frequency response is d-c to 11 cps at .027 in. per sec., with high frequency limit to 15,000 cps at top speed of 45 in. per sec. Maximum power required is 24w at 115v, 60 or 400 cps and/or 28v d-c. Operating temperature limits are –55 C. to 155 C., and altitude range is sea level to 100,000 ft. It has a recording time of 50 hrs., with plus or minus 2½% accuracy.

Circle No. 160 on Reader Service Card.

. . . Product Briefs

• **Couplings**—Essex Manufacturing Co., St. Louis, is offering self-sealing and nonself-sealing liquid oxygen quick-disconnect couplings. Presently used on Navy aircraft, the Essex coupling raises system efficiency by permitting rapid, nonleaking disconnecting of liquid oxygen supply or vent lines. It can be operated with one hand, and contains visual aids for determining locked position.

Circle No. 161 on Reader Service Card.

• **Relief valve**—Aero Supply Mfg. Co. Inc., Corry, Pa. is offering a relief valve with external preset screw featuring precision operation of cracking pressure. Cracking pressure range is 10 to 600 psi in operating range from –65F to 350F. Aero Supply says the valve is adaptable to higher or lower operating temperatures, and may be used with jet fuel, air, water, or other fluids. Line size is 1 in., with other sizes and port configurations available.

Circle No. 162 on Reader Service Card.

• **Flashlight circuit tester**—Designed by A. V. Olson Mfg. Co., standard flashlight has new tail end which houses compact circuit testing unit and plug-in receptacle with paired cord and clips.

Circle No. 163 on Reader Service Card.

• **Cold parts cleaner**—New immersion type cleaner by Permatex Co., Inc. is composed of highly concentrated blend of solvents under a water seal which also acts as a rinsing agent. Parts left overnight will not oxide or discolor, the company says.

Circle No. 164 on Reader Service Card.

• **Jet starter**—AiResearch Division of The Garrett Corp., Phoenix, Ariz., is making a jet aircraft engine starter designed for the F-105. Powered by either compressed air or a propellant charge, it can provide numerous pneumatic starts plus emergency starting independent of ground support equipment. It features a double-face turbine wheel with conventional vanes to take bleed air from a source such as a small gas turbine. Contained in the same wheel are impulse turbine buckets that provide over 100 hp when operating on propellant gases. A cockpit button electrically fires the solid propellant charge: the front-face vanes act to prevent overspeed. Aircraft applications other than F-105 are being planned.

Circle No. 165 on Reader Service Card.

• **Tachometer generator**—Servo-Tek Products Co. has a new version of its d-c tachometer generator. The manufacturer guarantees a brush life of 10,000 hrs. at 3,600 rpm. Linearity from 0 to 12,000 rpm is said to be better than plus or minus .10 of 1% of voltage output at 3,600 rpm. The commutator is fabricated of an alloy containing over 85% silver. Price in single lots is $22.50.

Circle No. 166 on Reader Service Card.

• **Valve test stand**—A pneumatic valve test stand for commercial jet aircraft has been developed by Paul-Munroe Co., Bell Gardens, Calif. Designed for functional tests on low-pressure pneumatic valves after overhaul, the unit will check leakage, air flow and operating pressures at limits. It features vertically mounted clamping fixture with foot control to allow operator to position component under test. Built to accommodate valves from ½" to 6" diameter, it gives 26v d-c and 115v a-c, 400 cycles, single phase.

Circle No. 167 on Reader Service Card.

• **Mass flow transducer**—Trans-Sonics Inc., Burlington, Mass. is marketing a mass flow transducer with a range of

The Boeing 707 jet airliner towers over Shell's jet fuel truck.

AeroShell Turbine Fuels for the Jet Age

The Boeing 707—America's first jet airliner scheduled for passenger service is ushering in the commercial Jet Age.

Ready to serve these new jets wherever they fly are AeroShell Turbine Fuels developed especially by Shell to meet the exacting requirements of this new Jet Age. Shell—largest supplier of commercial jet fuels and aviation gasolines in the U.S.A.—guards fuel quality by special handling techniques developed in Shell's unique AeroShell Turbine Fuel Equipment Laboratory.

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"FUELING THE BOEING 707"

This step-by-step picture story shows how single-point fueling works.

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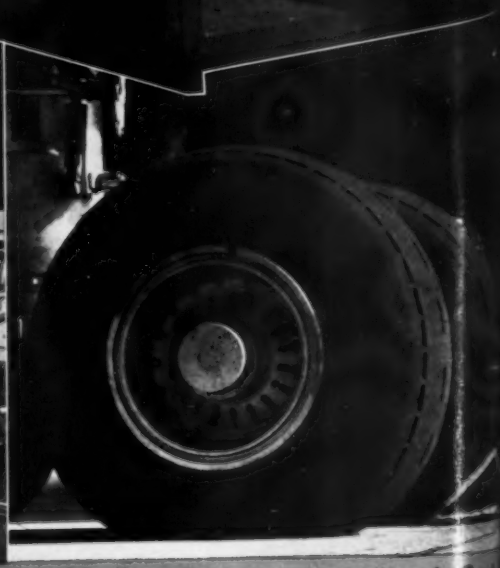

Continuous laboratory testing measured Jet-Tred for minimum heat build-up; confirmed adhesion to all applicable makes of casings and excellent resistance to heat, tear and abrasion.

On Boeing 707 prototype jet airliner, Jet-Tred proved thoroughly dependable in over a year of continuous service.

BY THOMPSON

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...en years of engineering, development and test-...g by Thompson is now terminated by qualification ... Jet-Tred for commercial operations. The qualifi-...tion test established conclusively that the most ...ingent requirements set up to measure perform-...ance of any tire, new or retreaded, can be met by ...et-Tred. In fact, the expected performance of ...et-Tred indicated by our tough in-house tests ...xceeds the standards established for the qualifica-...tion test. Although CAA requirements may vary ...somewhat from plane to plane, it is now clearly ...evident that Jet-Tred will meet or exceed the stand-...ards for any jet airliner regardless of speeds, weights ...or specific operating conditions. On that assurance, ...any airline can, with complete confidence, establish ...immediate and long-range procurement plans based ...on using Thompson Jet-Tred. There may be certain ...technical data you want on weights, inflation pres-...sures, tire cover, number of retreads per casing and ...other factors on which to base your planning. ...Thompson will be pleased to advise and work with ...you directly through Thompson sales engineers or ...by correspondence.

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Commercial jet airliners to be equipped with Jet-Tred.

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in the JET and
ROCKET AGE

ACOU-STACK
silencing system

Designed for Service Where Intense Heat Is Not A Factor!

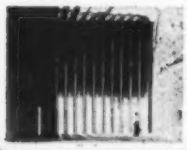

Photo shows exhaust end of Acou-STACK installation in the Lewis Unitary Wind Tunnel.

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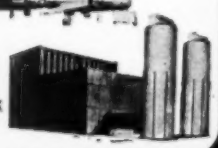
the ALL-STEEL Muffler Developed for Jet and Rocket Engines!

Dura-STACK Ground Run-Up Mufflers



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"MULTI-jet"
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MATERIALS AND EQUIPMENT

20 to 180 lbs. of air per minute in a 6 in. duct. The instrument has no moving parts, and utilizes platinum resistance elements to give direct measurement of true mass flow independent of temperature or pressure of the gas. The transducer provides 100 micro-ampere output signal as a function of the mass flow of air or other gas over operating temperatures of 40° to 150°F. Manufacturer says unit is qualified for service in commercial jet aircraft.

Circle No. 168 on Reader Service Card.

• **Cleaning by sound**—An ultrasonic cleaner has been introduced by Narda Ultrasonics Corp., Westbury, N.Y. It consists of a 40kc, 500 w output generator and a 10 gal. transducerized cleaning tank. The tank is deep-drawn to eliminate soil-entrapping cracks. Generator operates on 110/220v-50/60cps supply and uses 8 amp. The power drive provides over 500w average power input to the transducer. Manufacturer says it can also be adapted to plating, etching, anodizing, and many other processes.

Circle No. 169 on Reader Service Card.

• **Aircraft heater**—Aviation Equipment Dept., R. H. Reynolds Drill Co., Denver, Colo., has developed a cold weather heater to warm aircraft engines and ventilate cabins. Designed for large aircraft, the unit puts out 1,200 cfm. A Briggs & Stratton engine powers the blower which forces the hot air through spring-reinforced ducts. It weighs 110 lbs. and produces a 180°F temperature rise at 2,000 rpm. Reynolds says total heat output is 150,000 BTU.

Circle No. 170 on Reader Service Card.

• **High-temp capacitors**—Scintilla Division of Bendix has developed a family of high temperature capacitors. Called the E-315, they offer continuous operation at 315° and have a temperature range of –55° to 315°C. Capacitance is 0.05 to 4.0 microfarads at 600 volts d.c. with higher voltage available. These capacitors feature low capacitance and power factor variation, environmental resistance, hermetic sealing, no voltage derating, with minimum size and weight, the manufacturer says.

Circle No. 171 on Reader Service Card.

• **Steam cleaner**—Circo Equipment Co., Clark, N.J., is making a new high-pressure steam cleaner for aircraft use. Fully automatic controls eliminate manual adjustments of burner, the manufacturer claims. Mixing is automatic, and solution is fed into steam stream to emerge from the gun as a supersaturated steam jet. The units are available in two capacities: 110v, 1½ hp, or 220v, 3 hp. Both units have 15 gal. fuel capacity, with 15 gal. soap.

Circle No. 172 on Reader Service Card.

• **Propulsion unit**—Vanguard Engineering Co., Cleveland, has designed a self-contained electric propulsion unit providing drive, brake, and steering for any mobile device weighing up to 3,000 lbs. Called the Powr-Wheel, it has a normal speed of 2 mph, with a slightly higher no-load speed. The brake is actuated through the steering handle, which also contains the forward and reverse push-button controls. The Powr-Wheel is available in two models, the model 560, complete with battery, box, and cables, selling for $795, and the

LITERATURE

• **Phenolic resin**—Eight-page bulletin describing heat resistance and strength properties of V-204 phenolic resin. Contains complete data and recommended fabrication techniques for V-204 pre-impregnated on 181 glass fabric with A-1100 finish. Compares properties to Mil-R-9299. Eli Sandman Co.

Circle No. 176 on Reader Service Card.

• **Valve flanges**—Single-sheet bulletin designed to aid determination of flange requirements in specific applications. Includes information on Janitrol, Marman, thread, bolt, bead, and special type flanges. Barber-Colman Co.

Circle No. 177 on Reader Service Card.

• **Accelerometers**—Outlines the concept of using gas as damping medium for dynamic measuring devices. Gives advantages of gas damping over conventional oil damping. Notes relative insensitivity of gas to temperature change. Prepared by Dr. C. K. Stedman, paper gives graphic and mathematical data for design of a wide variety of devices using gas-damping. Statham Instruments Inc.

Circle No. 178 on Reader Service Card.

Dynamometer design—80-page, stiff-cover book describing traction dynamometers. Shows how to make spring testers, measure airplane wing deflection, motor torque, etc. Indexed for quick reference. W. C. Dillon & Co.

Circle No. 179 on Reader Service Card.

Cutting tool catalog—70-page manual covering special-purpose high thrust hydraulic cutting tools. Divided into nine sections according to the material to be cut, i.e. wire and rod, steel billet, tubing, etc. Manco Mfg. Co.

Circle No. 180 on Reader Service Card.

less complete model 550 priced at $595.

Circle No. 173 on Reader Service Card.

• **Stainless steel honeycomb**—The Crosley Division, Avco Manufacturing Corp., Cincinnati, has developed a new structural material. Light enough to float, Avcomb is a stainless steel honeycomb sandwich. Designed for application to high-speed aircraft, it meets heat-resistance and strength requirements needed for flight beyond 2,000 mph, Crosley says. Avcomb consists of six-sided steel cells, with a thin sheet of stainless steel brazed out of both sides of the honeycomb. The material is about a half-inch thick and can be shaped to contour.

Circle No. 174 on Reader Service Card.

• **Instruments**—Engis Equipment Co., Chicago, has published a 12-page catalog for reference use. Contains descriptions, illustrations and index for optical tooling and analytical metrology.

Circle No. 181 on Reader Service Card.

• **Runway lights**—Four-page brochure describing the advantages of a new flush-mounted runway lighting installation. Shows cross-section views of installation of different models and gives drawings of typical applications.

Circle No. 182 on Reader Service Card.

• **Glossary**—Nearly 100 terms relating to Electro-Mechanical Actuators are defined in a stiff-bound catalog from Hoover Electric Co.

Circle No. 183 on Reader Service Card.

• **Hardware**—First three sections of new hardware manual is ready for distribution. When fully complete, manual will contain specifications and detail drawings of over 700 aircraft hardware items. Sections now available cover standards on interchangeable door closure, latching, and locking devices, specific data on DC-3 and DC-4 door hardware. From Adams-Rite Mfg. Co.

Circle No. 184 on Reader Service Card.

• **Resin dispenser**—Brochure describes "triplematic" pump for automatic mixing, metering and dispensing two-part resins. Also covered is the company's line of epoxy and phenolic adhesives and setting compounds. H. V. Hardman Co., Inc.

Circle No. 185 on Reader Service Card.

• **Analog computer**—18-page brochure and folder describes and illustrates applications of new 80-amplifier master precision unit. Fourteen pages are de-

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A giant step has been taken in the U.S. military development program with contracts for the creation of an unprecedented primary strategic weapon system. It is the Air Force DYNA-SOAR, now in Phase-I design stage by a six-company project team under Martin direction.

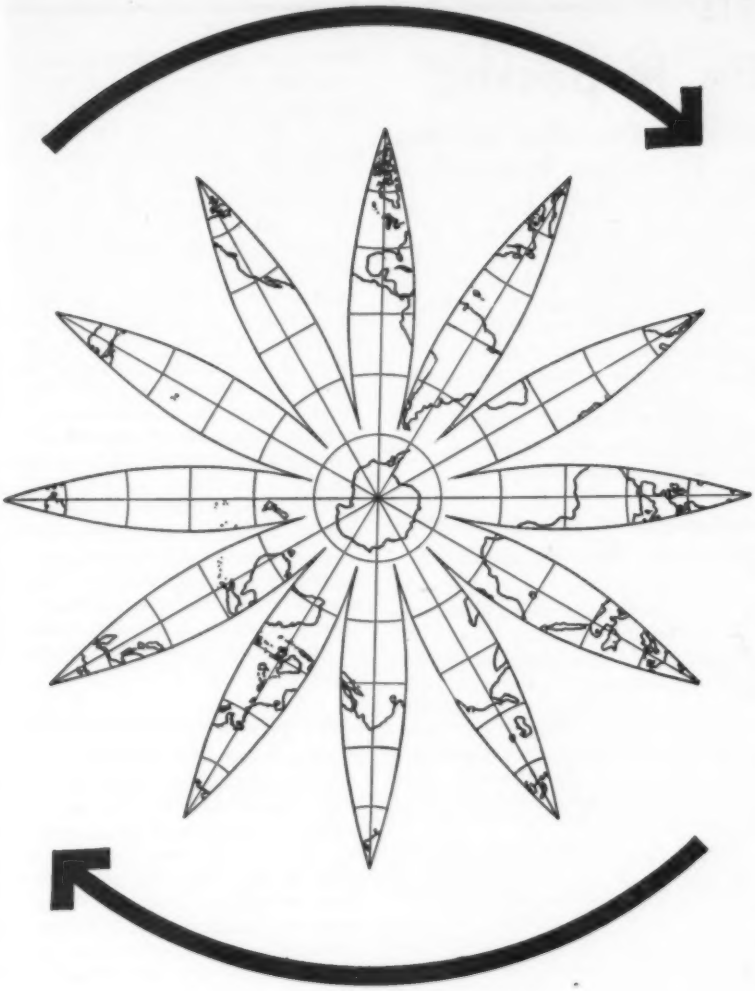
DYNA-SOAR—the most advanced military weapon system now in development—is a pilot-controlled bomber-reconnaissance space vehicle, its mission being to circle the earth at orbital velocity, with controlled aircraft landing capabilities. It will be propelled by several stages of rocket boosters, enabling it to operate from ground level to the ionosphere at hypersonic speeds.

In an entirely new and advanced concept of integrated industry coordination, the six companies teamed in this No. 1 military program constitute top capabilities in the basic areas of airframe, propulsion and radar guidance system development.

Bell, a pioneer in the boost-glide field, will design and build the airframe of the vehicle ...Bendix will develop communication, telemetry, hydraulic and electrical power conversion systems...Goodyear will produce the crew-escape capsule and the radar systems ...Minneapolis-Honeywell will be responsible for guidance and navigation to keep DYNA-SOAR on course and supply position and velocity information to the crew. American Machine & Foundry's responsibility is an advanced system of ground handling and launching equipment...And Martin will establish the configuration and design of the rocket boosters, carry out an experimental aerodynamic program for the complete vehicle, and assemble a full-scale mockup of the system.

Because of the challenging technical problems involved, the presidents of the six companies – aggregating assets of over $2 billion – comprise an active advisory panel, with their top engineering teams participating.

Never before in military history has so formidable a task force of specialized industrial capabilities been applied against such an advanced concept.



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LITERATURE

voted to specifications. Mid-Century Instrumatic Corp.
Circle No. 186 on Reader Service Card.

• **Aircraft tachometer tester**—8-page brochure provides technical data, functional schematics and performance specifications of the model TT-3 tachometer system tester, designed to meet requirements of MIL-T-26219 (USAF). Consolidated Airborne Systems, Inc.
Circle No. 187 on Reader Service Card.

• **Gearshift drive**—8-page technical bulletin describes construction, typical applications and gives comparative data of gearshift drive with other types. The Lima Electric Motor Co., Inc.
Circle No. 188 on Reader Service Card.

• **Hose assembly fittings**—16-page catalog describes line of synthetic and plastic hose products available from company. Included are specification tables with military part numbers, dimensions, performance standards and installation data. Flexonics Corp.
Circle No. 189 on Reader Service Card.

• **Sealed relays**—24-page bulletin offers up-to-date information on hermetically-sealed relays for military and general purpose industrial applications. Photos, circuit diagrams, coil data and specifications for miniature highspeed relays are included. General Electric Co.
Circle No. 190 on Reader Service Card.

• **Industrial truck**—4-page folder describes model F-45T4 electric-powered industrial truck which has a capacity of 4,000 lbs. Complete dimensional and design data is provided for both 48″ and 83″-high models. Elwell-Parker Electric Co.
Circle No. 191 on Reader Service Card.

• **Terminal blocks**—6-page brochure gives specifications, outline dimensions and general information on terminal blocks for computer applications. Solderless blocks are designed to accept "AMP 53" solderless taper pins. DeJur-Amsco Corp.
Circle No. 192 on Reader Service Card.

• **Environmental test equipment**—4-page bulletin describes new line of products designed for mass-testing of production components. Environments obtained include high-low temperature, salt spray, altitude, humidity etc. Wyle Associates.
Circle No. 193 on Reader Service Card.

• **Thermocouple assemblies**—36-page catalog describes and illustrates line of thermocouple assemblies and sealing glands. Conax Corp.
Circle No. 194 on Reader Service Card.

Circle No. 24 on Reader Service Card.

"Airport Aid to Be Repassed"

Los Angeles' Don Belding makes prediction after meeting with Quesada; L.A. to get nearly $4 million from U.S.

The Administration will ask the Congress to restore federal airport aid on a gate-to-gate basis, which would make matching funds available for runways and taxiways, but not for terminal buildings.

Don Belding, president of the Los Angeles Board of Airport Commissioners, made the prediction following a conference in Washington with E. R. Quesada, the new Federal Aviation Agency administrator. Belding added that he had "every assurance" the airport act will be repassed and the President will sign it.

On the gate-to-gate premise, Belding hopes the Los Angeles International Airport can count on between $3 and $4 million from the government as against something between $5 and $9 million lost all told if the President's veto stands.

The Los Angeles airport has had to postpone $8.1 million of work planned with funds from the $59.7 million bond issue passed by the voters in 1956 because of the loss of federal money and other financial factors, including higher costs and increased demands from the airlines. One of the projects set back is the satellite complex for the international carriers. This is not urgent, however, since international traffic into Los Angeles is still under 3% and present facilities actually will be adequate for many years to come, Belding said.

Four carriers now make use of the customs, immigration and public health facilities at the present airport terminal. They are CMA, Pan American, SAS and Western Air Lines. REAL, the Brazilian carrier, comes in shortly, but only for one flight a month. Japan Air Lines, now negotiating for approval of Los Angeles as a coterminal to San Francisco, is talking about a thrice-weekly service starting sometime in 1959. BOAC may establish a twice-weekly operation next year. Another down-the-road possibility is Lufthansa, but, Belding said, all could be handled from the present terminal facilities even with jet operations.

Originally planned to be ready by Jan. 1, 1960, it now will be late 1960 or early 1961 before the new Los Angeles airport facilities will be in full operation. This means there will be a period of a few months when the airport will miss out on expected higher revenues and thus possibly fail to meet bond interest and redemption requirements; but by 1965, Belding said, the airport should have a surplus of $5 or $6 million. This cannot be used for capital expenditures without approval from the voters because of a stipulation accompanying the $59.7 million bond issue that no other capital funds were to be spent by the airport department until 1970.

A modification of this provision may be sought after the surplus is accumulated, Belding said.

Procedures at Miami Airport Criticized, Results Praised

Dade County (Fla.) Port Authority got a left-handed pat on the back from Special County Auditor Robert M. Morgan, after having been earlier raked over the coals by a county grand jury over its method of negotiating leases at Miami International Airport. A special audit of the Port Authority's records confirmed that procedures used were poor, but conceded the results obtained were good.

Morgan reported that while the procedures followed by the Port Authority in negotiating airport concessions were obscure and it was difficult to establish the financial stability, identity and background of many proponents, in each contract the Port Authority got a minimum guarantee of $10 a square foot rental. "Anytime you get that much," he said, "you've made a good deal."

The auditors' recommendation to the Port Authority: Keep permanent files of all data used in contract negotiations.

Indifference Loses Aviation Funds for Colorado Counties

Colorado State law pertaining to aircraft ownership and registration fees may need overhauling. A survey made by the Denver Post revealed registration fees, payable annually, were collected on only 180 planes during the nine months ended last Sept. 30. The all-time high was 482 in 1953. Records of the Civil Aeronautics Administration show 942 registered civil aircraft in the State as of Jan. 1, 1958, of which only 34 are listed as used in scheduled or irregular commercial air service.

The obvious failure of a large proportion of aircraft owners to pay the annual assessment is blamed on indifference of county governments who have most to gain from collection of the tax. The state gets only 15 cents out of the $2 flat registration fee on each plane. The county, where paid, retains $1.85 out of each fee plus all of the specific ownership tax. The latter in itself provides a source of considerable aviation revenue for local aviation projects. It is based on a graduated scale ranging from 3% to 70% of the factory list price the first year of the aircraft use to 3% of 20% of the list price the fifth year of use. Yet, the survey indicates county clerks in many instances have discouraged payment by conscientious aircraft owners with a "nobody else pays the tax, why should you?"

Appointment of a state aeronautics director to head the division of aeronautics created by the Colorado State legislature and approved by the governor last year might spur enforcement. Others believe the tax law should be changed; still others advocate its abolishment.

Los Angeles Airport Will Have Few Jet Restrictions

Los Angeles Department of Airports states there will be no restrictions placed on commercial jet operations at Los Angeles International Airport, except on the "rare occasions when a west to east take-off is necessary." Normal take-off pattern is east to west over the ocean. On west to east departures there will be restrictions as to hour and take-off load. This means that a jet transport heading east cannot take off in the early morning hours unless it is light enough to be at a good altitude above the residential areas to the east, the department explained.

With North American Aviation and the El Segundo Division of Douglas Aircraft both located on the airport, Los Angeles International has had jet operations since 1945; hence the advent of jet transports with sound suppressors is not a radical event for the airport, the department pointed out.

American Airlines will be the first to introduce commercial jet operations at Los Angeles when it begins its Boeing 707 transcontinental service next month.

. . . Airport Briefs

• **Aeroflot picks L.A.**—Don Belding, president of the Los Angeles Board of Airport Commissioners, says Aeroflot the Russian airline, already has decided on Los Angeles International Airport for its West Coast point of entry when, as and if it is allowed to extend its operations to the U.S.

• **AA seeks L.A. alternate**—With the Air Force reluctant to permit the mixture of traffic at Palmdale, American Airlines, which starts jet service on its transcontinental route January 25, is considering the Ontario International Airport for an alternate for Los Angeles. The two airports are only a few miles apart, but weather charts indicate Ontario is open 96% of the time Los Angeles International is down. Lockheed Air Terminal is too limited, so if Ontario can't be used it will be Phoenix or Las Vegas for AA's Boeing 707s.

• **Self-preservation**—Wichita Municipal Airport has relocated its lost and found department as a result of a recent bomb mishap which occurred as an innocent-looking package found aboard a plane was being turned in by an unsuspecting victim. Travellers seeking the lost and found will now have to walk two miles north of the terminal building to a spot at the end of a narrow path leading through one of the airport lakes.

• **Double-deck parking**—Increased capacity at virtually no increase in use of terminal area for auto parking is being provided at Bradley Field, Windsor Locks, Conn., with the opening of what is reportedly the first parking deck to be erected at an airport. The deck and the parking facilities below it will accommodate 344 cars. The steel frame structure was built by Airport Parking Co. of Cleveland, O., under terms of a 15-year lease agreement with the Connecticut Aeronautics Commission.

• **Canada switches ownership**—Among major changes adopted by the Canadian Department of Transport in its new policy on airports was the decision to vest title to all airport land in the federal government to protect the federal interest. At airports receiving scheduled air service, runways, taxiways, lighting systems and navaids are all financed and constructed by the federal government, irrespective of who might operate the field. General aviation airports and air strips are helped through grants-in-aid varying in amount up to a maximum $100,000 under the new policy adopted by the transport department.

• **All-aluminum hangar**—Reynolds Metals Company is building an all-aluminum aircraft hangar at Byrd Field, Richmond, Va. The $325,000 hangar will measure 165 x 108 ft. and will house the company's entire fleet.

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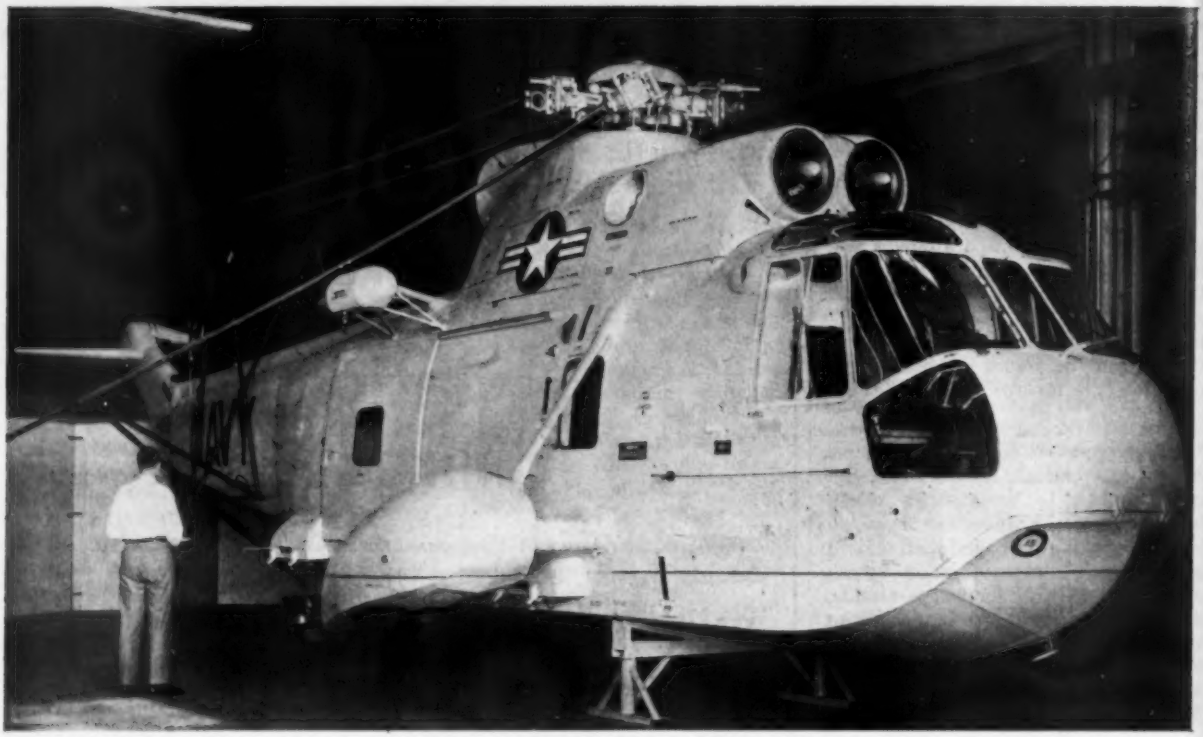
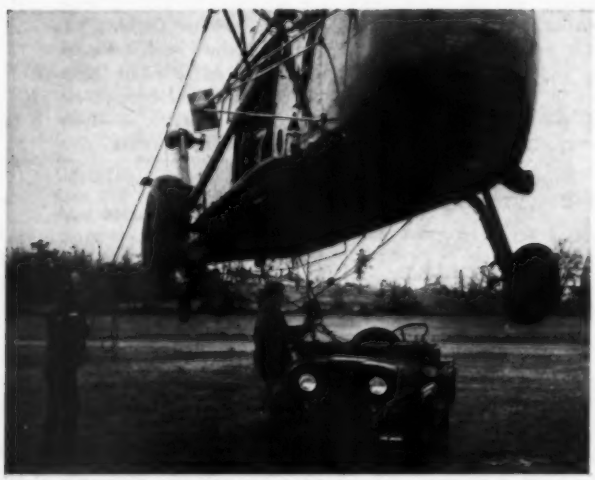


TWIN-TURBINE HSS-2—Scheduled for first flight in 1959, the HSS-2 anti-submarine helicopter (Sikorsky S-61) is being developed for the U. S. Navy. It features twin turbine engines, all-weather flight capabilities, and a flying boat hull enabling it to operate from land, water, mud or snow. Shown above in mockup, the new Sikorsky HSS-2 will offer substantial advances in payload, endurance, and cruising speed.

AROUND THE WORLD WITH SIKORSKY HELICOPTERS



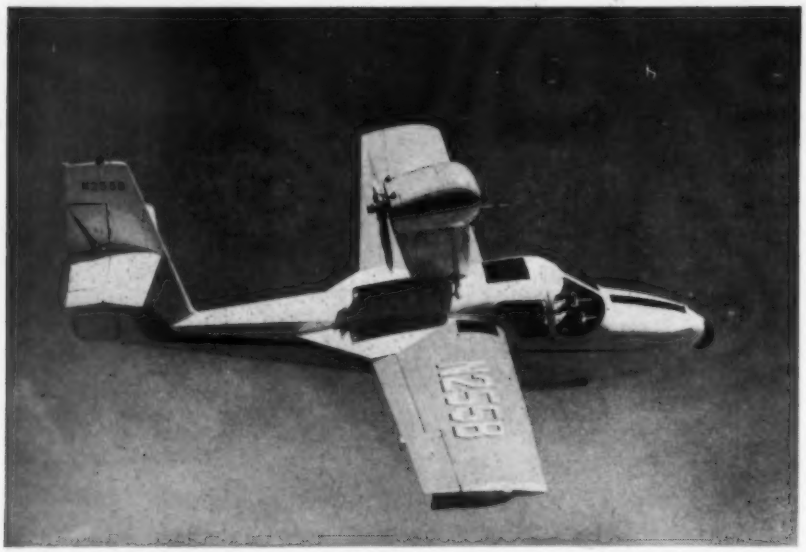
ELECTRONIC TETHER—The Army demonstrates a device developed by Sikorsky for ground control of a flying helicopter using a 50-foot cable. The "tether" aids in hooking up loads to a sling, as shown above, and is also useful for maneuvering near the ground when the pilot's visibility is reduced by darkness, dust or snow.

100th S-56 HELICOPTER—Sikorsky Aircraft has completed the 100th S-56, the free world's largest production helicopter. The aircraft was a Marine Corps HR2S-1. The S-56 is also built as a U. S. Army troop and cargo carrier designated the H-37A. An S-56 holds the world speed record for helicopters—162.7 mph, set in 1956.

DROWNING NEW FOREST FIRES—Hovering over a newly-started fire in the woods of Western Canada, a Sikorsky S-58 operated by the Okanagan Group drops 225 gallons of water to control the blaze until fire fighting crews also flown in by helicopters can reach the scene. A large helicopter is better suited for this modern fire fighting technique than a fixed-wing airplane since a direct hit on the fire can be achieved more easily thanks to the 'copter's ability to fly in any direction or to hover. Small fires can be checked speedily and efficiently, before they grow. The Okanagan Group, whose large fleet includes 1 Sikorsky S-58 and 20 S-55 helicopters, currently operates throughout Canada, performing many important jobs such as providing air transport in support of radar installations and carrying mail, food, and supplies to remote areas throughout the country, many inaccessible by other means of transportation.

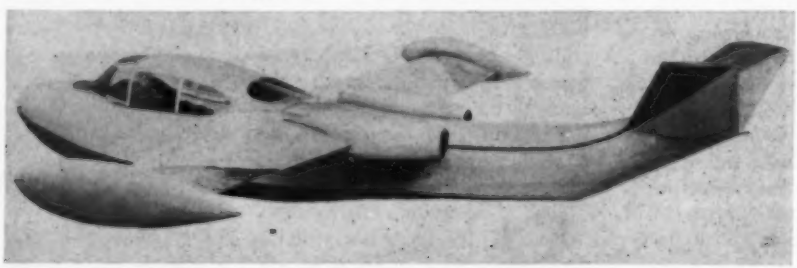
SIKORSKY AIRCRAFT
STRATFORD, CONNECTICUT
One of the Divisions of United Aircraft Corporation

Amphibs: There's Demand But No Production



COLONIAL AIRCRAFT CORP., Sanford, Me.—This company is producing the four-place, single-engine Skimmer C-2, which is a development of the three-place Skimmer C-1 of which only 17 were built. Last year, a contract was negotiated between Colonial and Amphibious Aircraft, Inc.—exclusive Skimmer sales agent—for the delivery of a minimum of 150 aircraft. Deliveries started last December and have continued at the rate of one a month. Colonial expects to increase this to four a month shortly.

TRECKER AIRCRAFT CORP., Milwaukee, Wis.—For a number of years, Trecker has been marketing the Italian P.136-L1 Gull and P.136-L2 Super Gull. Differing only in powerplants, the basic airframes are constructed by Piaggio & C., shipped to Trecker which installs engines, propellers and instruments and markets the finished product.



AIRCRAFT MARINE ENGINEERING CO., Van Nuys, Calif.—A new contender in the amphibious market, ACME is constructing the prototype Anser A-1 as it is called —a six-place twin-jet amphibian scheduled to make its first flight sometime next year.

Why is the amphibian rapidly becoming an outcast of aviation when landplane sales are booming?

Consensus is that it is slower, more expensive to buy, and costs more to maintain. This is true to some extent, amphibian proponents point out, but this must be weighed against the fact that it offers double utility.

Today's amphibious fleet is made up largely of out-of-production Republic Seabees, Grumman Widgeon, Mallard and Goose aircraft. But their numbers are steadily decreasing and the low rate of production of newer models keeps the overall total about even.

Proof that a larger market does exist for new amphibians is illustrated by the success of McKinnon Enterprises of Sandy, Ore. For several years, this company has been converting Grumman Widgeons to take more powerful engines, to bring performance more in line with modern business aircraft.

Apart from this sole example of converting older aircraft, only two manufacturers of production amphibians exist in the U.S. today. A third manufacturer is developing a twin-jet amphibian but it is not expected to enter full-scale production before 1960.

Several other manufacturers of single-engine landplanes are offering optional amphibious gear in place of the wheel landing gear. However, it appears that little effort has been made to break into the amphibious market on a large scale.

All three amphibious aircraft manufacturers are reasonably optimistic over the future market potential of their aircraft.

Amphibian Specs

	Colonial Skimmer	Trecker Super Gull	ACME Anser
Seats	4	5	6
Dimensions:			
Length	23' 6"	35' 7"	39'
Span	34'	44' 5"	46'
Height	8' 10"	12' 7"	11'
Weights:			
Empty	1,525 lbs.	4,630 lbs.	4,100 lbs.
Gross	2,350 lbs.	6,614 lbs.	10,200 lbs.
Powerplants	(1) Lyc. O-360-A1A	(2) Lyc. GSO-480-A1A6	(2) Cont. 420M turbojets
Rating	180 hp for takeoff	340 hp each for takeoff	1,200 lbs. each
Performance			
High speed	136 mph	208 mph	471 mph
Cruise speed	125 mph	184 mph	450 mph
Rate of climb	600 fpm	1,279 fpm	1,600 fpm
Range	500 mi.	994 mi.	2,200 mi.
Price (standard)	$21,700	$89,925 $74,500*	Approx. $200,000

*P.136-L1 Gull

'59 Beech Line Shown

Aircraft feature greater ranges, interior changes

Beech Aircraft Corporation, in Wichita last month, unveiled the company's 1959 line of aircraft to more than 350 representatives of its sales and service organization.

Briefly, here is the Beech line for '59:

• **K35 Bonanza**—Said to be the fastest single-engine business airplane flying today, the new Bonanza—11th version of this series—features greater range, new interior appointments and a wider selection of optional equipment. Powerplant is a 250 hp Continental I0-470-C fuel injection engine which gives a top speed of 210 mph and a cruise speed of 200 mph at a gross weight of 2,950 lbs. Rate of climb is given as 1,170 fpm and service ceiling of 20,000 ft. Range is increased to 910 miles with standard 50-gallon tank or 1,245 miles with an extra 20-gallon auxiliary tank. Other features of the 1959 Bonanza include redesigned instrument panel, provision for installation of a fifth seat, redesigned seats which give more leg room and a choice of interior fabrics. Price: $25,300 for standard model.

• **Travel Air 95**—Introduced less than a year ago, the new model has undergone little change. Refinements include installation of better exhaust mufflers and new shock absorbing engine mounts which are said to reduce vibration and noise level to a minimum. Optional equipment includes a five-seat arrangement and wide choices of radio equipment. Price: $51,500 for standard model.

• **G50 Twin Bonanza**—Major change in the new Twin-Bonanza is the installation of 340 hp Lycoming IGSO-480-A1A6 supercharged fuel injection engines, which increases the service ceiling to 28,300 ft. fully loaded and extends its maximum range to 1,720 miles. Max. speed is given as 240 mph and cruise speed 228 mph. Gross weight is given as 7,150 lbs. Price: $92,500 for standard model.

• **D50B Twin Bonanza**—Basically an improved D50A, the new model's main improvements have been confined to the interior. Six seating arrangements are again offered but at least two of these include provision for a sideways-mounted couch. A new 12 cu. ft. baggage area has been added. Price: $80,500 for standard model.

• **Super 18**—Completely new interior and exterior styling, wide selection of radio, radar and autopilot installations, and a choice of either Hamilton Standard two-blade propellers or three-blade lightweight Hartzell propellers are features. Use of the Hartzell propellers allows a gross weight up to 9,300 lbs.

• **MS 760 Paris**—This twin-jet executive aircraft is marketed in the U.S. by Beech under license from the Morane Saulnier Company of France. One aircraft has been delivered to a U.S. customer and a second aircraft is currently being used as a demonstrator by Beech.

Piper Introduces Low-Cost, Four-Place Caribbean

Piper Aircraft Corp. offers a new low-cost, four-passenger lightplane known as the "Caribbean." Derived from the PA-22 Tri-Pacer, the new model was designed specifically for airport operator, flying club and private owner use.

It is powered with a 150 hp Lycoming O-320 engine and has a fuel capacity of 36 gallons. A de luxe version instrumented for cross country flying also is offered. Either two- or three-control systems are available and the aircraft is stressed for spins and limited acrobatic maneuvers. Deliveries are expected to begin next month. Price is $8,395 for the standard version or $9,350 for the de luxe model.

——Caribbean Specifications——

Dimensions	
Length	20 ft. 7 in.
Span	29 ft. 3½ in.
Weights	
Empty	1,100 lbs.
Gross	2,000 lbs.
Performance	
Maximum speed	139 mph
Cruise speed (75% power at 7,000′)	132 mph
Initial rate of climb	725 fpm

. . . Business Flying Briefs

• **Djinn for ag market**—Republic Aviation Corp. is reportedly offering the Sud Aviation Djinn helicopter to the agricultural market. Cost of operation is said to average under $6.50 per hour.

• **Another Goose conversion**—Franklin Aviation Enterprises of Miami is currently converting a Grumman Goose amphibian to take two Lycoming GSO-720-A1A engines rated at 520 hp each.

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—INTERNATIONAL REPORT—

SOLENOID VALVES

CESSNA L-27A

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Cessna

Circle No. 15 on Reader Service Card.

—INTERNATIONAL REPORT—

By Anthony Vandyk

Nationalistic feeling in Europe is such that actual mergers of flag airlines are virtually out of the question. But the partnership agreement between SAS and Swissair has started a lot of speculation. Lufthansa and Sabena, in particular, are known to be looking for "mates." There is already a large amount of cooperation between Lufthansa and Air France and some observers believe that this may be developed into a real partnership. As for the Belgian Airline, it would seem logical for Sabena to choose KLM as its partner in view of the close cooperation between Belgium and The Netherlands (Benelux). But the fact that the Dutch carrier has chosen Douglas DC-8s and Sabena Boeing 707s for jet equipment is one of the several things that do not make it easy for these two very independent companies to get together.

• **Obsolescence problem**—The problem of aircraft which have become prematurely obsolescent is apparent to anyone passing through several of Europe's major airports these days. For example at Amsterdam KLM has Constellations and Convair 340s standing idle. At Orly Airport, Paris, five perfectly good four-engine Armagnacs are unemployed. And at London airport there is a batch of cocooned Constellations formerly operated by BOAC. Incidentally, BOAC used Constellations for a period of over 12 years, until last October. The Constellations fleet carried some 500,000 passengers and flew a total of over 300,000 hours.

• **Copter Experiment**—How well will a helicopter service do in a coastal area during the peak vacation season? Last summer the French tried to find the answer with an experimental service operated with a Vertol 44B between points on the northern coast in the vicinity of Caen and Le Havre. The experiment was interesting because the route passed over the Seine estuary and thus represented a considerable time saving over surface transport. The helicopter passengers were handed questionnaires. The results of these have just been published and show that 55.6% rode the Vertol for a sightseeing trip while 38.8% took it "out of curiosity." Just under half had previously flown in fixed wing aircraft. Most passengers were aware of the service's existence from the press (40.8%). The great majority liked the service although 46.8% thought it too expensive. The Vertol 44B did well. Regularity was about 100% on the 110 scheduled round trips and the 9 additional flights. It carried 3,392 passengers, representing an average load factor of 52.5%.

• **BOAC's modern designs**—BOAC has gone in for industrial design in a big way. Not only has a standard aircraft interior decor been selected for such items as seat covers, carpets, curtains and the visible interior surfaces of the structure of the aircraft, but also for many minor items not normally considered to merit the attention of a specialized industrial designer. These items include bed linen, crockery, trays, magazine covers and cigarette boxes. The interior decor scheme has been adopted by BOAC from the designs of Gaby Schreiber and Associates in conjunction with Alec Jones, the airlines' Advertising Manager.

• **Le Bourget still tops**—Le Bourget Airport is temporarily the French Capital's jet airport pending the completion of runway extension work at Orly. In addition to the daily Pan American 707 on the New York-Paris-Rome route Le Bourget has four weekly visits from the TU-104A—both Aeroflot and Czechoslovakia's CSA use the Russian jet on their Moscow-Paris and Prague-Paris services. Le Bourget was France's first jet airport. UAT-Aeromaritime has its base at this field and operated Comet 1As to Africa several years ago. Two of these early-model Comets are, in fact, still at Le Bourget. Long a matter of litigation between UAT and de Havilland, the two jet transports are no longer in flying condition and no one seems to know what should be done with them. For the record, it should be stated that UAT was well pleased with its Comet 1As and greatly regretted that they had to be grounded. The French independent airline, which now has a fleet of Douglas DC-8s on order, still operates some de Havilland aircraft —piston-engine Herons in Africa.

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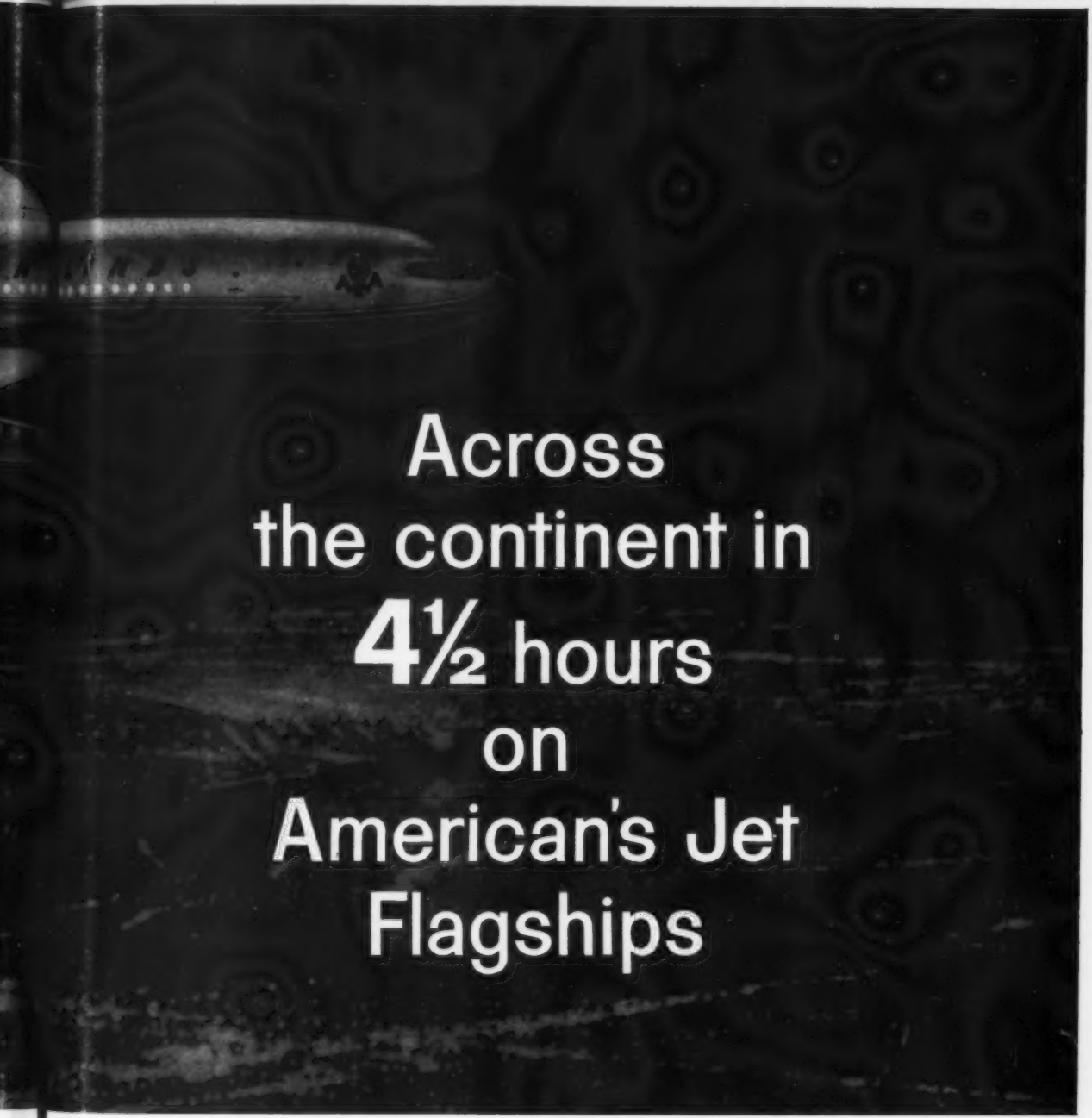

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Hinds Named Consultant To North American Aviation

Major Gen. John H. Hinds (U.S. Army, ret.) has been named consultant for North American Aviation, Inc., in Washington, D.C. General Hinds' last tour of duty was as chief of the Development and Test Section, Continental Army Command, bringing to an end 37 years of commissioned service.

People on the move in . . .

. . . Transport

Earl A. Robertson, formerly director of reservations service for Northeast Airlines, has accepted a position with The Teleregister Corp. in connection with its CUTLASS Project.

Herman F. Scheurer, Jr., of the law firm of Leasure and Scheurer of Washington, D.C., has joined West Coast Airlines as vice president-administrative and legal.

Delta Air Lines has announced the promotion of the following executives to key posts: **Thomas M. Miller** was named vice president-traffic and sales administration; **Charles P. Knecht** was promoted to assistant vice president-sales; **Paul W. Pate** advanced from director of properties to assistant vice president-properties; **C. B. Wilder** was elected assistant vice president-technical operations.

Francis T. Billerbeck, formerly assistant regional sales manager for SABENA, has been appointed head of the company's newly created sales department.

Arthur J. Fallon and **Thomas M. Sullivan** have been appointed as deputy directors of aviation of The Port of New York Authority. Fallon was chief of the Air Terminal Properties Division of the Port Authority; Sullivan was formerly chief of the Aviation Planning Division.

. . . Manufacturing/Military

James S. Myatt, Jr., formerly chief service engineer for Whittaker Controls Division of Telecomputing Corporation, has been named manager of the division's New York field engineering office.

Hiller Aircraft Corp. has announced the appointment of **William Callery, Jr.,** to the post of sales manager and a three-man staff of regional sales managers: **Henry Eagle, Jr.,** eastern and central; **Kirby Achee,** southern; and **Fred Jamieson,** western.

Frederick R. Lack, retired director and vice president of the Western Electric Co., has been elected a director of Hazeltine Corp.

William G. Evans, chief of subcontract for Convair (San Diego) Division of General Dynamics Corp., has been named general purchasing agent.

Merton R. Fallon, product manager of Minneapolis-Honeywell's Aeronautical Division's ground support equipment sales, has been named manager of field service engineering.

E. C. Burns, administrative assistant at Beech Aircraft Corp., has been promoted to manager of a new manufacturing control division.

Harry P. Whitney, II, has been elected chairman of the executive committee of Omega Aircraft Corp.; **Jaques R. T. Du Pont** was elected company treasurer.

Cessna Aircraft Co. announced the election of **Vincent E. Moore,** corporate general accountant, as assistant secretary. This is in addition to his former duties.

Kenneth Morris, manager of Boeing Airplane Co's Moses Lake, Wash., Flight Center, has been promoted to factory manager of the company's Seattle Division.

John E. Smircina, formerly assistant to the general manager of Summers Gyroscope Co., has been named assistant to the vice president-general manager of Chicago Aerial Industries. **Paul L. Williams** was appointed director of industrial relations for the company.

E. M. Armstrong, formerly sales manager of Air Logistics Corp., has been elected vice president of customer relations for Coleman Engineering Co.

Edward Harbison has been appointed as Dayton representative for Grumman Aircraft Engineering Corp.

Robert D. Roche, formerly a meteorologist with General Chennault's Flying Tigers, has been named division engineer of Lockheed-Marietta's Military Operations Research Division.

E. Z. Gray, former manager of flight technology and vehicle design branch of Boeing's Systems Management Office, has been named acting director of systems engineering, replacing **H. J. Longfelder,** who is on a one-year assignment with the Institute of Defense Analyses in Washington, D.C.

Defense Systems Department of General Electric has announced the appointments of the following new section managers: **Warner R. Sinback,** marketing operations; **Walter B. Booth,** employe relations; **John K. Records,** ground and information systems engineering section; **Gen. Haywood S. Hansell,** defense evaluation operation, Washington, D.C.; **Richard C. Raymond,** technical military planning operation, Santa Barbara, Calif.; **Curtis G. Talbot,** flight test operations, Schenectady, N.Y.; **Walter A. Hahn, Jr.,** systems management research operations; **Donald L. Johnson,** manufacturing operations.

W. R. Clay, formerly director of engineering, research and development section, Rheem Manufacturing Co., has been appointed assistant to the vice president of engineering, Radioplane, a division of Northrop Aircraft, Inc.

Milton Sanders, formerly with American Machine and Foundry, has been named manager of customer projects for the Teleregister Corporation; **Earl Robertson,** from Northeast Airlines, has been named Project 328 manager; and **Byron Halsted,** formerly with W. A. Case & Son, becomes treasurer.

R. G. McCoy has been appointed general manager of The de Havilland Aircraft Co. Ltd.; **D. R. Newman** has been appointed chief aerodynamicist.

W. F. Shaylor, commercial manager, and **A. D. Baxter,** chief executive of the Rocket Division and the Nuclear Power Group, of the de Havilland Engine Company, were elected to the Board.

. . . Airports

Claude F. King, retired commissioner of airports for the City of Cleveland, has joined Servair, Inc., Cleveland-Hopkins Airport Terminal, as vice president and consultant.

Melvin B. Borgeson has been named deputy chief, Planning Division, Office of Airports, Civil Aeronautics Administration. He previously served as chief of the Planning Division, CAA Region I, New York, and more recently as aviation consultant for a private consulting firm. **Louis P. Croft,** formerly with the Federal Housing and Home Finance Agency, has ben named planning officer in CAA's Airports Office Planning Division in Washington.

Paul F. Brabazon has resigned as president of Tele-Trip Co., wholly owned airline trip insurance subsidiary of Mutual of Omaha. He had no immediate plans for any new association.

Herbert C. Godfrey, Jr., has resigned as manager of Lindbergh Field, San Diego, Calif., to assume the post of director of Hillsborough County (Fla.) Aviation Authority, Dec. 1. In his new post, he will be responsible for the management of three airport facilities: Tampa International, Peter O. Knight, and Plant City airports.

Southeastern Airport Managers' Association elected the following officers at its 12th annual meeting in West Palm Beach, Fla.: **Arven H. Saunders,** Raleigh-Durham, N.C., president; **Frank J. Sakser,** West Palm Beach, vice president; and **Matt V. Pilcher,** Sarasota-Bradenton, Fla., secretary-treasurer.

WEST COAST TALK

By Fred S. Hunter

Howard Hughes—or perhaps we should say the Hughes Tool Co.—has an order in for one Lockheed Electra, and the industrialist has already been checked out on the airplane. As is customary in Hughes transactions of this type, no public announcements have been made, but the best information is that Hughes logged about four hours on No. 1002, one of the test aircraft, for familiarization on the turboprop. The fact that Hughes has one Electra on order does not necessarily mean that TWA will add Electras to its fleet. Hughes has placed single plane orders before. A Douglas DC-6, for example, and a Viscount. But if Hughes takes a fancy to the Electra—as other pilots have after flying the turboprop—it certainly won't hurt Lockheed's chances.

• **Credit where due**—It seems to us that the Air Force adds to its own stature when it recognizes devotion to duty such as was the case recently with Lt. Col. Thomas L. Murphy of the Directorate of Flight Safety Research at San Bernardino. He was awarded the Air Force Commendation Medal for precipitating the studies which led to the program for structural reinforcement of the B-47 airframe. Supervising the investigation of a fatal B-47 accident, Col. Murphy refused to believe this was an isolated case and finally persuaded the responsible agencies that the problem of B-47 structural integrity needed further study. "This action will save the USAF the lives of aircrews, untold dollars in material and contribute to conserving the USAF combat potential," said the citation.

• **Sign of the times**—In the old days Los Angeles real estate promoters used to take their prospective customers in buses out to giant lot sales at new subdivisions in the San Fernando Valley and similar areas on the outskirts of town. Now they haul 'em in DC-4s to the Salton Sea and other sites that now are the real estate frontiers in southern California. Makes a new source of charter revenues for the local airlines, such as Pacific Southwest Airlines. And makes us wonder who will grab off the space charter for the first lot sale on the moon? Probably one of these go-getters, Bob Prescott of the Flying Tigers or Orvis Nelson of Transocean.

• **Clutch hitter**—Marquardt Aircraft Co., which 10 years ago had less than 200 employes and has grown to 4500, keeps boosting its batting average. It won the competition for the air-induction control subsystem on North American Aviation's long-range interceptor from such big-league bidders as Bendix, Hamilton Standard, General Electric, Minneapolis-Honeywell and Lear, and you have to be able to hit the curves to beat those folk.

• **PAL's back**—San Francisco newspapers say Philippine Air Lines, which gave up its transpacific operations a few years ago, has ordered two Douglas DC-8s and will be back in the San Francisco International Airport by 1960.

• **Test time bought**—Pacific Airmotive Corp., planning expansion of its jet engine overhaul shop at Burbank, has settled the test-stand problem for 1959 by negotiating an agreement with North American Aviation for time on its test cells. NAA has three J57 test cells at its propulsion field laboratory in the hills at Santa Susanna and only modification required to convert a cell to accommodate commercial-type engines is in the mounting.

• **West Coast quickies**—After 18 years in the engine business, LeRoy Cooper, who headed up Wright Aeronautical's west coast office, has turned airplane salesman and is now helping Jake Moxness sell DC-8s . . . Pan American, it is estimated, is grossing $1 million a month per airplane on its first Boeing 707 jetliners, which is a lot of moola, but you have to keep load factors up . . . And a friend of ours who figured he could treat his wife to a trip to Europe by taking advantage of the economy tariffs, says these low fares are strictly a snare and a delusion. The clothes his wife bought for the trip cost more than the ticket.

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Boeing 707*	Rolls-Royce Conway
Douglas DC-8*	Rolls-Royce Conway

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AIRTRENDS

Domestic trunklines showed encouraging traffic trend in October. Passenger-miles hit 2.10 billion, about the same as September and up from 2.02 billion in October 1957. Load factor was 60.21%, up from September's 58.24% and 58.43% in same month last year. It was only the third time this year that load factor has exceeded 60% (June 62.81%, August 63.16%).

Shortage of space on all-cargo planes during Christmas rush is now definitely expected by cargo officials (A/A Oct. 20, p. 89). Load factors on freighters have been running very high in past couple of months. One flight, for example, averaged 97% for an entire month. American Airlines, incidentally, is hauling cargo on its Boeing 707 training and familiarization flights. AA carries any loads that are available, but emphasizes that shippers can't buy space on the 707 and that the flights don't constitute regular scheduled service.

Selling point being used against jets by some transatlantic piston-engined operators: they can fly nonstop while jets must make intermediate stop at least one way, sometimes both ways. One piston-engined carrier has been stressing in ads that it flies both ways nonstop. Another has been using the line: "Not even a fuel stop."

Change in working control of Alaska Airlines is in the making. Carrier has long been controlled by Raymond W. Marshall, who formerly served as president and as board chairman and who is now a director. Alaska president Charles F. Willis Jr. heads a group that is buying 200,000 shares of stock from Marshall at $7 a share. So far, about 100,000 shares have been purchased (32,000 by Willis) and the deal may be completed by year-end.

Stepped-up anti-airline campaigns by railroads are predicted by some airline observers. Among other things, surface carriers are expected to fight airport bond issues and continue to pound away at subsidies.

Jet spare parts service to help airlines hold down inventories will be offered by Boeing Airplane Co. Manufacturer in mid-January will establish a spares facility at New York International Airport, stock it with 3,500 to 4,000 items for the Boeing 707 and 720. Facilities, space and stock personnel are to be furnished by Allied Maintenance Corp. under contract.

Rumor in Washington last week was that Bradley Nash, Deputy Undersecretary of Commerce for Transportation, would be named Undersecretary. This job has been vacant since resignation of Louis Rothschild several weeks ago.

Trans-Texas Airways' "Maximized" DC-3s averaged 162.5 mph (takeoff to landing) in 9,640 hours flown during July to September, 8.6 mph faster than any other exclusive DC-3 operator. TTA's average hop was 79.9 miles, seventh longest and three miles below average for 10 carriers.

Disposal of surplus government transport aircraft is getting increased attention in Washington. Inventory of such planes as the C-46 now totals several thousand and the list continues to grow. One plan under consideration is for the government to sell these overseas, with the help of Export-Import Bank loans. Foreign carriers buying the surplus transports would be required to certify that they would be used exclusively on domestic routes within their own country.

There are indications from the White House that CAB Vice Chairman Chan Gurney may be named chairman of the board next year. The President designates regulatory board chairmen on an annual basis and some advisors are urging that the CAB job be rotated.

Traffic carried by Military Air Transport Service continues to increase. In Japan, MATS activities have been moved from Tokyo International airport to Tachikawa Air Base. Shift means an increase of 18,000 passengers monthly at Tachikawa, about 70% of this traffic carried under contract by U.S. civilian carriers.

AIRTRENDS

An estimated $30 million will be spent in fiscal 1959 on research and development for modernization of the nation's airways, an eight fold increase over fiscal 1958. Work of the Airways Modernization Board, now a bureau of the Federal Aviation Agency, is currently ahead of schedule and prospects are that certain phases of its studies will be further speeded up as a result of new test and evaluation equipment recently installed at its Atlantic City experimental center.

The long-standing controversy over asphalt vs concrete for airstrip paving will be aired this month before the Hebert (D-La.) Subcommittee of the House Armed Services Committee in connection with its investigation of weapon system management. Due for examination are airstrip paving materials and standardization studies of the Air Force.

New proximity warning device is being studied by Airways Modernization Board. Based on Light Beam Communication (use of light as signal carrier), the system is capable of day or night operation within approximate five-mile range. Intelligence transmitted to pilot warns him of intruder's presence, leaving visual detection as basis for any required evasive action. The device is made by Decker Corp., Philadelphia, and is said to give full spherical protection.

More intensive investigation of lightplane accidents is promised by the Civil Aeronautics Board with the transfer of this former function of the Civil Aeronautics Administration to the CAB under the new Federal Aviation Agency Act. Feeling within the Board is that too many accidents have been blamed on "pilot error" in the past without sufficient probing into the cause.

Adequacy and needs of existing airports and airport facilities will come up for review in the full-scale study proposed by Sen. George Smathers (D-Fla.) to determine what changes might be needed in existing law and federal aviation policy to cope with problems of the jet age (see page 54).

Bolstering of union strength at airports may be expected. International Brotherhood of Teamsters is currently conducting a survey at 22 of the nation's major hubs with an eye to bringing additional airport workers within its orbit and to determining the effectiveness of existing teamster organizations if called upon to support a strike at one of the airports. Classifications included in the survey are airport taxi, limousine, bus, baggage handling, maintenance and service employes, such as commissary, cleaners, washers, porters, janitors, and matrons; plus catering truck and fuel truck drivers, plane refuelers, and airfreight handlers or trucks.

Air Coordinating Committee, as an entity, is slated for extinction under the Federal Aviation Agency Act. The act specifically provides that the FAA Administrator "shall not submit his decisions for the approval of, nor be bound by the decisions or recommendations of, any committee, board, or other organization created by Executive order."

Fear that growth of international air travel might well overtake health facilities at many international airports is indicated in the recent active interest in airport management expressed by WHO (World Health Organization) through the formation of the Committee on Sanitation of International Airports. Main problem being studied by the committee is improving sanitation methods at international airports for the control of diseases carried by food or water or by insects. As one approach to the problem, the committee has recommended publication of an International Manual on Airports Sanitation, including a guide to sources of specialized information on the subject, dealing with all branches of international aviation.

Engine ingestion of foreign objects is one of three major concerns of international insurance underwriters with jet operations. The other two are air turbulence at high altitudes and high speeds leading to difficulties of air traffic control.

Capital strike ends, NWA strike averted; but . . .

Trouble's Brewing on Labor Horizon

A pattern for settlement of mechanics' wage disputes in the airline industry seemed to have been formed late last month with the signing of two contracts—one of them after a 37-day strike.

Only a mechanics' strike at TWA at presstime and the possibility of a similar walkout at Eastern threatened to reverse this trend.

But still unanswered in many cases were the vital questions of jet pilot pay and crew complement on the new aircraft. Thus, one of the most turbulent labor periods in airline history continues.

Northwest and Capital signed mechanics' contracts, paving the way for two years of peace with the International Association of Machinists. Increases granted were substantial.

An indication of the size of the increases granted by Capital and NWA can be seen from the following: A Presidential emergency board last September, issuing recommendations in the dispute between IAM and Capital, Northwest, Eastern, TWA, Northeast and National, favored a 20¢ per hour increase with a two-year contract. At Capital, IAM demanded 42¢ and struck. Final settlement was 41¢, but with a three-year contract instead of two. The NWA contract is substantially the same.

Here's how the Capital increase applies: 15¢ per hour hike retroactive to Oct. 1, 1957; 18¢ retroactive to Oct. 1, 1958, with 8¢ added on Oct. 1, 1959. Contract expires Sept. 30, 1960, the same date as Northwest's, which also contains retroactive features.

Although Capital gave no estimate, the increases seem certain to add more than $2 million to the company's wage bill over the life of the contract.

Other airlines still face other problems.

Pan American was still flying its transatlantic jet services with supervisory pilots, lacking agreement with Air Line Pilots Association on jet pay and whether flight engineers should have commercial pilots' licenses.

National Airlines, planning to open jet service New York-Miami on Dec. 10 with Boeing 707s leased from PAA, has an ALPA contract covering jet pay. However, the agreement can be reopened on the question of crew complement.

American Airlines, set to open Boeing 707 and Lockheed Electra service in late January, has no pilot contract. It signed with FEIA some months ago. Negotiations with ALPA have been unsuccessful, and AA's pilots are free to walk out at any time.

Eastern Air Lines agreed that flight engineers on its DC-8s in 1960 would be required to have pilots' licenses. EAL pilots, in turn, started training on the Electra. But FEIA was expected to ask the courts to prevent the company and ALPA from making any agreement having to do with engineers.

West Coast and Piedmont—in the local service industry, pilots of two lines—were flying the Fairchild F-27 turboprop without contracts. David L. Cole is acting as a neutral in the WCA case and will submit a fact-finding report that will be used as the basis for negotiation.

MYSTERY DC-8? Actual Douglas jet, obviously retouched by artist, is the first to show DC-8 in airline markings.

NWA Looks for Cash to Buy DC-8s & Electras

Northwest Airlines is negotiating loans and making arrangements for a preferred stock issue to finance its purchase of five Douglas DC-8s and 10 Lockheed Electras.

The company is seeking a 20-year $40 million loan from institutional investors and a seven-year $32.5 million bank loan. In addition, it plans to raise about $11 million through sale of 449,040 shares of cumulative convertible preferred stock.

New funds will be applied first to liquidate borrowings under NWA's present $34 million credit agreement with banks. The balance, together with cash generated from depreciation and retained earnings, will be applied toward acquisition of the jets and turboprops and related spare parts, equipment and ground facilities, and for other general corporate purposes. Total cost of the program is estimated at $67.5 million.

In connection with NWA's purchase of five DC-8s, for delivery from March through September, 1960, Douglas will either accept on trade-in or purchase five NWA DC-7s at unit cost of $1,350,000 or total of $6,731,000, including spares and equipment.

On the 10 Electras, for delivery from July to December, 1959, Lockheed will accept on trade-in or purchase nine NWA Boeing Stratocruisers for $3.5 million.

Irish Air Lines: The Bargain Hunter's Carrier

If Fares Seem Too High—They Cut 'Em

By Robert Burkhardt
Transport Editor

In Boston they tell of the old Irishman whose nostalgia for the "auld sod" was tempered by his recollection of crossing the storm-tossed Atlantic in steerage. "Sure," he would say with emphasis, "and you won't catch me going back until they build a bridge."

For the benefit of all such homesick immigrants, Irish Air Lines now offers that bridge. Service to New York started this past Spring; Boston was inaugurated in October; Chicago is next on the list.

To learn more about Irish Air Lines' new service to America, I accepted an invitation to join the Boston inaugural festivities. First point to be cleared up was the name itself, and, to help me understand, I was told that Irish Air Lines was like a leprechaun—it didn't really exist, but was very real nevertheless. That is, Irish Air Lines is the name used generally by two operating companies that are owned by a holding company that in turn is owned by the Irish government.

Aer Lingus is the operating company for the British and European routes; **Aerlinte Eirann** is the company responsible for transatlantic operations. **Aer Rianta** is the government holding company owning all of Aerlinte and 95.4% of the stock in Aer Lingus. Balance of the Aer Lingus stock is owned by the British, and a proposal is now pending before the Civil Aeronautics Board in Washington to permit Seaboard & Western Airline—lesser of the Super Constellations used for the new transatlantic service—to buy 25% interests in Aerlinte.

• **Growth picture**—In 22 years of operations, Irish Air Lines has made steady and rapid growth. In 1937 only 800 passengers and a few parcels of freight represented the total business; last year the company grossed nearly $900 million.

From a single route, Dublin-Bristol, service has grown to the point where Dublin is linked with more than 20 key cities in Britain and on the Continent and, this year, with America. One reason for this growth is the ingenuity of the Irish Air Lines management in offering an attractive service to the public at the lowest practicable cost.

There are no luxury flights on Irish Air Lines. Across the Atlantic and on the routes to Britain and Europe all flights are economy class, and there are frequent excursion fares to lure the traveler who would like to travel by air but feels he cannot afford it.

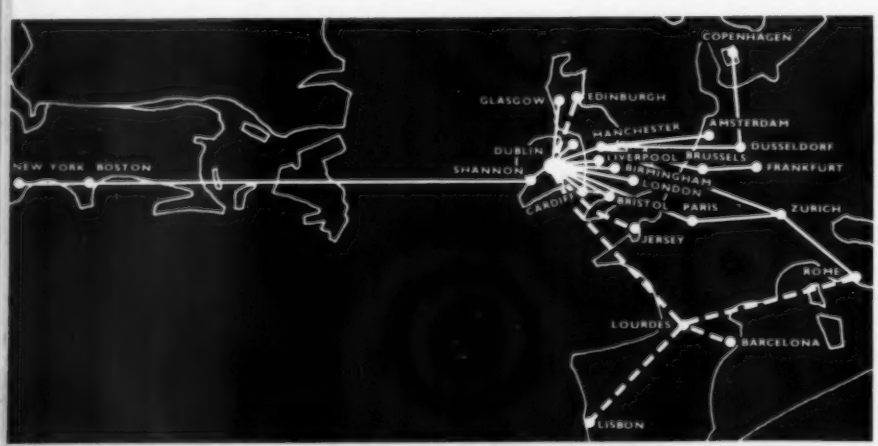
• **Fare manipulation**—Over the years, Irish Air Lines—whose management is free to try innovations even though ownership is vested in the government—has accumulated a great deal of practical experience with the effect of fare cuts on traffic.

Indeed, they have the art so perfected, says Garret FitzGerald, the company's lively economist, that traffic can be readily and quickly shifted from week-end peaks to fill midweek dips by the use of a fare reduction. The same technique is successful in diverting passengers from crowded daytime schedules to night flights and other off-peak runs. As a result of this highly skilled manipulation of fares, the company has returned a profit over the years despite the lowest average fare of probably any short-haul airline in the world.

Irish Air Lines is now 22 years old and in the usual course of events could be expected to have its quota of peat-encrusted old-timers who had worked their way up through the seniority lists. If there were any of these, I didn't see them. FitzGerald, who has done such brilliant work on fares and schedules, is a young man in his 30s.

General Manager J. F. Dempsey, who joined Irish Air Lines as a young secretary-accountant shortly after operations started in 1936, confirmed this impression of managerial vigor and freedom. "Hiring is non-political and based on merit," he told me in his office on the second floor of a converted house on Upper O'Connell street in Dublin. "Promotions are made on the same basis and we encourage initiative and enterprise."

• **Equipment modernization**—No better evidence of the initiative and enterprise of this carrier can be found than the decision of its management to boldly order Viscounts when they were



LISBON AND COPENHAGEN service will be begun next year. Dotted lines on map represent seasonal routes flown. Latin country stops are scenes of Catholic shrines.

JEREMIAH F. DEMPSEY is the energetic general manager of Irish Air Lines.

FOKKER FRIENDSHIPS (pictured) and Viscount 800s will make up the bulk of Irish's fleet.

first offered, and then to reorder. As a result, Irish Air Lines is now placing on the used aircraft market four of its Viscount 700s.

These planes have proved their value, but the decision has now been made to standardize the fleet with new 800 series Viscounts and Fokker Friendships. Both these planes will be powered with the same Rolls-Royce engines (simplifying maintenance and spare parts storage) and, of great importance in scheduling, both ships have the same average cruise speed and can be used interchangeably on routes when traffic changes seasonally. The new Viscounts will seat 60; the Friendship, 36-40.

Five DC-3s will be kept in stand-by to meet unexpected traffic peaks, but the decision has been made to sell off five remaining from an original fleet of 13.

Transatlantic Air Travel Reaches New Peak

More than 466,000 passengers flew the North Atlantic this past summer, an increase of over 35% over the same three-month period last year and a new record high, according to the exclusive AMERICAN AVIATION compilation shown below. Approximately two-thirds of the travelers elected to take advantage of the new economy class service introduced last April. Of serious interest to U.S. carriers—Pan American and TWA—is the fact that their share of the U.S. origin-destination traffic is now only a little more than 40%, the lowest on record.

Eastbound Revenue Traffic of North Atlantic Carriers 3rd Quarter 1958

	Seating Capacity				Revenue Passengers				% Seats Utilized			
	First	Tourist	Economy	Total	First	Tourist	Economy	Total	First	Tourist	Economy	Total
U.S.												
Air France	5,201	4,790	13,668	23,659	2,726	3,128	6,969	12,823	52.4	65.3	51.0	54.2
Alitalia	1,804	752	6,110	8,666	708	487	2,889	4,084	39.2	64.8	47.3	47.1
BOAC	9,424	7,430	16,464	33,318	5,146	5,025	11,824	21,995	54.6	67.6	71.8	66.0
Lufthansa	1,366	2,199	9,785	13,350	864	1,344	6,291	8,499	63.3	61.1	64.3	63.7
El Al	684	....	3,710	4,394	212	....	2,410	2,622	31.0	....	65.0	59.7
Iberia	916	852	2,340	4,108	212	379	744	1,335	23.1	44.5	31.8	32.5
Irish	....	....	8,372	8,372	....	....	2,437	2,437	....	....	29.1	29.1
KLM	3,721	5,953	15,048	24,722	2,028	2,815	7,564	12,407	54.5	47.3	50.3	50.2
PAA	15,378	10,478	45,648	71,504	9,150	6,365	24,683	40,198	59.5	60.7	54.1	56.2
Qantas	374	693	553	1,620	163	359	140	662	43.6	51.8	25.3	40.9
Sabena	2,851	2,632	14,870	20,353	1,758	1,594	8,145	11,497	61.7	60.6	54.8	56.5
SAS	5,990	....	25,055	31,045	3,409	....	14,844	18,253	56.9	....	59.2	58.8
Swiss	2,468	408	7,728	10,604	1,629	343	4,924	6,896	66.0	84.1	63.7	65.0
TWA	7,690	9,381	33,977	51,048	4,131	3,882	17,067	25,080	53.7	41.4	50.2	49.1
U.S. Total	57,867	45,568	203,328	306,763	32,136	25,721	110,931	168,788	55.5	56.4	54.6	55.0
Canada												
BOAC	870	739	5,719	7,328	426	354	3,505	4,285	49.0	47.9	61.3	58.5
CPAL	864	1,151	3,768	5,783	306	689	2,321	3,316	35.4	59.9	61.6	57.3
KLM	728	....	4,289	5,017	427	....	2,450	2,877	58.7	....	57.1	57.3
TCA	2,199	2,823	8,836	13,858	885	1,661	7,137	9,683	40.2	58.8	80.8	69.9
Canadian Total	4,661	4,713	22,612	31,986	2,044	2,704	15,413	20,161	43.9	57.4	68.2	63.0
Grand Total	**62,528**	**50,281**	**225,940**	**338,749**	**34,180**	**28,425**	**126,344**	**188,949**	**54.7**	**56.5**	**55.9**	**55.8**

Westbound Revenue Traffic of North Atlantic Carriers 3rd Quarter 1958

U.S.												
Air France	5,377	4,900	14,222	24,499	3,758	4,344	11,989	20,091	69.9	88.7	84.3	82.0
Alitalia	1,575	712	6,146	8,433	729	511	4,874	6,114	46.3	71.8	79.3	72.5
BOAC	9,288	7,254	16,035	32,577	6,326	6,542	14,571	27,439	68.1	90.2	90.9	84.2
Lufthansa	1,339	2,523	10,464	14,326	888	1,908	9,017	11,813	66.3	75.6	86.2	82.5
El Al	738	....	3,920	4,658	321	....	3,640	3,961	43.5	....	92.9	85.0
Iberia	916	852	2,340	4,108	303	510	1,531	2,344	33.1	59.9	65.4	57.1
Irish	....	....	8,296	8,296	....	....	4,471	4,471	....	....	53.9	53.9
KLM	3,889	6,184	15,834	25,907	2,682	4,588	12,893	20,163	69.0	74.2	81.4	77.8
PAA	16,129	11,476	49,711	77,316	11,895	9,322	41,724	62,941	73.7	81.2	83.9	81.4
Qantas	409	670	679	1,758	289	485	455	1,229	70.7	72.4	67.0	69.9
Sabena	2,976	2,536	17,490	23,002	1,526	1,659	11,973	15,158	51.3	65.4	68.5	65.9
SAS	6,039	....	26,727	32,766	3,846	....	21,530	25,376	63.7	....	80.6	77.4
Swiss	2,408	408	7,510	10,326	1,729	375	6,413	8,517	71.8	91.9	85.4	82.5
TWA	8,086	9,189	32,417	49,692	6,319	7,038	26,941	40,298	78.1	76.6	83.1	81.1
U.S. Total	59,169	46,704	211,791	317,664	40,611	37,282	172,022	249,915	68.6	79.8	81.2	78.7
Canada												
BOAC	828	726	5,785	7,339	577	619	5,237	6.433	69.7	85.3	90.5	87.7
CPAL	857	1,141	3,742	5,740	453	930	3,229	4,612	52.9	81.5	86.3	80.3
KLM	752	66	4,612	5,430	641	63	4,249	4,953	85.2	95.5	92.1	91.2
TCA	2,097	2,589	9,218	13,904	1,161	2,134	8,736	12,031	55.4	82.4	94.8	86.5
Canadian Total	4,534	4,522	23,357	32,413	2,832	3,746	21,451	28,029	62.5	82.8	91.8	86.5
Grand Total	63,703	51,226	235,148	350,077	43,443	41,028	193,473	277,944	68.2	80.1	82.3	79.4

Investigation Due

Sen. Smathers will seek study of airline industry

A full-scale study of the airline industry to determine what changes might be needed in existing law and federal aviation policy to cope with problems of the jet age will be sought in January by Sen. George Smathers (D-Fla.), a ranking member of the Senate aviation subcommittee.

Smathers will sponsor legislation authorizing such an investigation, and said it should cover: a review of airline economic and financial policies, existing CAB regulatory policies, adequacy of the industry's equipment to serve the public, disposition of its present equipment, proper role of local service lines in relation to trunklines, function of cargo carriers and freight forwarders, and adequacy of existing airports and facilities.

Stating that the airlines have obligated themselves for $5 billion worth of jet equipment, he added that "it must be ascertained whether such action . . . is sound or whether it constitutes a reckless plunge into financial indebtedness which might ultimately be detrimental to the welfare and safety of the traveling public."

High jet operating costs raise "a serious question as to whether the airline industry can afford to commit itself and have on hand such expensive equipment without some sound assurance that traffic demands will permit its economic use," he said.

Scoreboard on Turbine Aircraft Buying

Orders for U.S. Jet and Turboprop Transport Aircraft

BOEING

707—120	
Pan American	6 (Model 121)*
American	25 (Model 123)*
Continental	4 (Model 124)
TWA	15 (Model 131)
Qantas	7 (Model 138)
Cubana	2 (Model 139)
USAF	3 (VC-137)
707—220	
Braniff	5 (Model 227)
707—320	
Pan American	17 (Model 321)
Air France	17 (Model 328)
Sabena	5 (Model 329)
TWA	18 (Model 331)
SAA	3 (Model 334)
707—420	
Lufthansa	4 (Model 430)
Air India	3 (Model 437)
BOAC	15 (Model 436)
Varig	2 (Model 441)
707—020	
American	25 (Model 023)
720	
United	11 (Model 022)
TOTAL	**187**

CONVAIR

880	
TWA	30
Delta	10
Transcontinental	4
REAL	4
Capital	9
Swissair	5
600	
American	25
TOTAL	**87**

DOUGLAS
DC-8

Pan American	21
Panagra	4
United	40
National	3
Eastern	20
KLM	8
Japan Air Lines	4
Trans Canada	6
Delta	6
Swissair	3
SAS	7
Olympic	2
UAT	2
TAI	2
Trans Caribbean	1
Alitalia	4
Northwest	5
Iberia	2
TOTAL	**140**

FAIRCHILD
F-27

West Coast	6**
Piedmont	10*
Pacific	6
Bonanza	6*
Wheeler	2
Avensa	5**
Wien Alaska	1
No. Consolidated	3**
LAV	6
Aerovias Ecuatorianas	1
Quebecair	2**
Cubana	4
Lloyd Aero	3
Trans Mar	1
Aloha	3
Corporations	15
TOTAL	**74**

LOCKHEED
ELECTRA

American	35
Eastern	40**
Braniff	9
National	23
KLM	12
Western	9
Allison Div. of GMC	1*
Ansett/ANA	2
Pacific Southwest	3
Aeronaves de Mexico	3
Cathay Pacific	2
Northwest	10
Qantas	4
Trans Australian	2
Garuda	3
Tasman	3
Unannounced	1
TOTAL	**162**

Orders for Foreign Jet and Turboprop Transport Aircraft

BRISTOL
BRITANNIA

BOAC	33*
El Al	4*
Aeronaves de Mexico	2**
Canadian Pacific	6**
Air Charter	2*
Cubana	4
Hunting Clan	2
British Ministry of Supply	3
R.A.F.	20
TOTAL	**76**

De HAVILLAND
COMET

BOAC	19*
BEA	6
Aerolineas Argentinas	6
East African	2
DH 121	
BEA	24
TOTAL	**57**

FOKKER
F-27

KLM	2
Aero Lingus	7*
Trans Australian	12
Braathens Safe	3
TAE	3
Aviaco	6
Dutch Gov.	1
R.I.V. Turin	1
Australian DCA	2
Sabena	12
PAL	2
RNAF	12
Trabajos y Enlaces	3
Ansett/ANA	6
Deta	2
BKS	2
Corporations	2
Unannounced	1
TOTAL	**80**

SUD AVIATION
CARAVELLE

Air France	24
SAS	16
Finnair	3
Air Algerie	3
Varig	3
Royal Air Maroc	1
TOTAL	**50**

At presstime, a total of 355 Viscounts (all models) had been delivered out of a total of 402 ordered. These aircraft are in service with, or on order for, a total of 52 operators in 33 different countries. Listed below are the remaining unfilled orders.

Aer Lingus	3
Airwork	2
BEA	1
Canadian Gov't	1
Cubana	4
Continental	3
Hunting Clan	5
Lufthansa	8
New Zealand National	2
Northeast	2
Niarchos Group	1
Pakistan International	3
SAA	5
Trans Australian	2
Trans Canada	4
Vasp	3
VANGUARD	
BEA	20
TCA	20
VC-10	
BOAC	35
TOTAL	**122**

*Some delivered.
**Delivered.

Two at a Time

American to score a first with 707, Electra starts

American Airlines next month will introduce two new airplanes almost simultaneously—the Lockheed Electra turboprop between New York and Chicago on Jan. 23, the Boeing 707 jet New York-Los Angeles on Jan. 25.

This is believed to be the first time that two new planes have been placed in regular service by one airline in such a short space of time.

The Electra's scheduled flying time on the Chicago route will be 2 hrs. 5 mins. eastbound, 2 hrs. 25 mins. westbound, with six roundtrips daily. The transcontinental jet time will be 4 hrs. 30 mins. eastbound, 5 hrs. 30 mins. westbound, starting with one daily roundtrip Jan. 25, increasing to two on Feb. 1. The Electra will use New York's LaGuardia Field and Midway Airport, Chicago. The Boeing 707 will operate between New York International and Los Angeles International.

AA's 707 will carry 112 passengers, 56 first-class in the forward section with two-abreast seating, and 56 coach aft with three abreast. The Electra will be 68-passenger first-class, two abreast.

. . . Transport Briefs

• **CAB hits "sleeper seat"**—The Civil Aeronautics Board has ruled that it is illegal for TWA to provide transcontinental passengers with a special sleeper seat without charging an extra fare. CAB figures it's worth at least 20% more than the first class tariff.

• **It's now Aloha**—Trans-Pacific Airlines' stockholders approved a change in the company's name to Aloha Airlines and authorized the board of directors to negotiate a loan for purchase of three Fairchild F-27s and an option on two.

• **TWA Starts Florida service**—TWA will start service on its route to Florida on Dec. 16. The route extension will provide TWA transcontinental service for the first time to Nashville, Atlanta, Tampa, St. Petersburg, Clearwater and Miami.

• **PAL loan for F-27s**—Pacific Air Lines received CAB approval of a guaranteed loan for purchase of six Fairchild F-27 turboprop transports. Cost of planes and spares is $5,145,565; CAB's loan guarantee was for $4,631,000 and was made to Bank of America National Trust and Savings Association. Loan must be repaid in 10 years at 5½% interest.

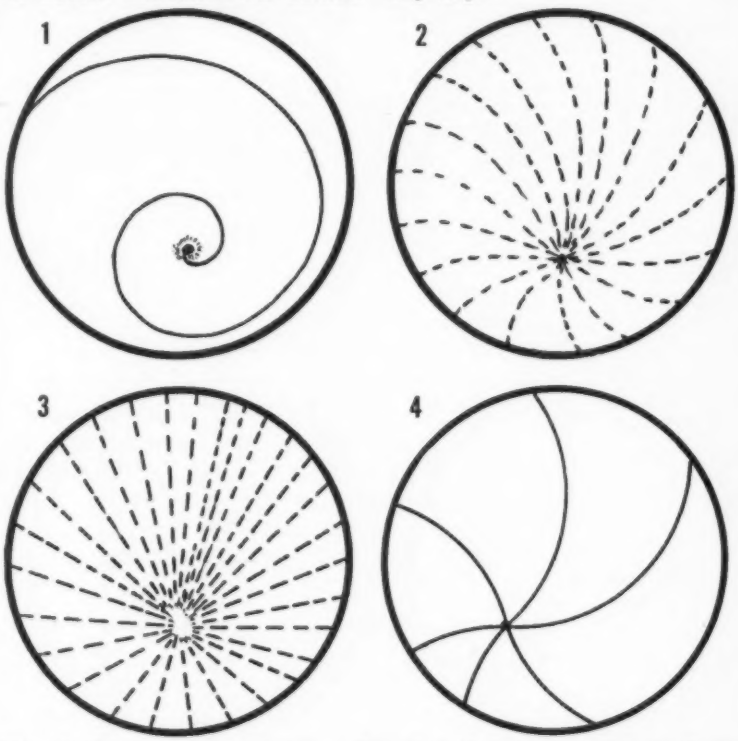
TECHNICAL TIPS

That Radar "Trouble" May Not Be Trouble at All

American Airlines reports its Radar Overhaul Shop has been receiving "squawked" units which prove to be serviceable when checked. It seems the "trouble" actually is caused by interference patterns (below) set up by other sets operating in the vicinity.

According to American, these patterns vary greatly depending on the distance from the other radar unit, inverter frequency, type of radar, etc., but it's pointed out that this condition alone is not an indication of trouble. The airline has advised its radar technicians to check for these patterns on the 150-mile range before removing a set for repairs:

1. Bright dot may start at center or outside edge and tend to follow sweep in spiral.
2. Number of lines and distance between dots may vary.
3. Dots may be visible through 360° or in one sector. Number of lines and distance between dots may vary.
4. Lines may start at center or outside edge, and number of lines may vary.



Here's Some New Dope on Combustion Chamber Action

Combined studies of Champion Spark Plug Co., Wright Air Development Center, and the Ethyl Corp., have uncovered some interesting facts about combustion chamber phenomena during single plug operations.

Tests indicate that on single mag, combustion chamber temperature drops an average of almost 10%, even when Manifold Absolute Pressure (MAP) is increased to create a constant Indicated Mean Effective Pressure (IMEP) condition. It was found that less knock occurs with only one plug firing, although the thermal efficiency falls off and Specific Fuel Consumption (SFC) rises. Due to efficiency loss, there is an increase in exhaust valve temperature.

In What Month Was It Made?

CAA must have gone starry-eyed. Airworthiness Directive 58-22-2 reads: "Inspect the main landing gear trunnion shaft every 200 hours with a horoscope . . . etc." A rueful spokesman says it should have read "boroscope," but the boys are taking quite a ribbing. One needle-sticker sent in a divining rod with the suggestion that CAA surely could find some use for it.

Summary of U.S. Airline Traffic for July 1958 vs. July 1957

Compiled by American Aviation Publications from Official CAB Data

Airlines	Revenue Passengers (In Thousands) 1958	1957	% Change	Revenue Passenger Miles (In Thousands) 1958	1957	% Change	Total Ton Miles Rev. Traffic 1958	1957	% Change	% Available Ton-Miles Used 1958	1957
DOMESTIC											
American	615	638	— 3.6	457,854	463,507	— 1.2	53,750,022	53,627,252	0.2	56.4	58.6
Braniff	165	166	— 0.6	72,549	74,448	— 2.6	7,960,239	7,973,171	— 0.2	46.4	45.5
Capital	320	341	— 6.2	126,280	130,003	— 2.9	13,209,202	13,517,012	— 2.3	44.5	45.2
Continental	75	76	— 1.3	39,775	37,206	6.9	4,143,617	3,854,379	7.5	40.6	46.5
Delta	217	217	.....	106,895	106,958	— 0.1	11,890,192	11,560,743	2.8	50.6	55.6
Eastern	629	646	— 2.6	343,125	355,452	— 3.5	35,412,806	36,842,226	— 3.9	46.3	45.5
National	112	115	— 2.6	65,901	72,266	— 8.8	7,112,087	7,701,959	— 7.7	43.2	53.5
Northeast	92	93	— 1.1	32,360	25,901	24.9	3,286,317	2,583,245	27.2	38.0	51.3
Northwest	141	129	9.3	110,972	95,080	16.7	12,059,738	10,518,072	14.7	49.5	54.2
Trans World	395	413	— 4.4	367,470	372,015	— 1.2	38,918,748	39,255,089	— 0.9	60.0	61.2
United	592	573	3.3	464,028	457,963	1.3	52,928,175	51,868,715	2.0	56.2	58.5
Western	112	123	— 8.9	60,946	65,330	— 6.7	6,317,403	6,810,715	— 7.2	43.5	57.4
TOTALS	**3,465**	**3,530**	**—1.8**	**2,248,155**	**2,256,129**	**—0.3**	**246,988,546**	**246,112,578**	**0.3**	....	....
TERRITORIAL											
Caribair	24	22	9.1	1,673	1,587	5.4	180,370	171,979	4.9	70.4	66.7
Hawaiian	49	44	11.4	15,345	7,054	117.5	1,528,708	711,034	115.0	69.5	55.3
Trans Pacific	22	19	15.8	3,146	3,523	—10.7	261,128	256,863	1.7	62.7	55.3
TOTALS	**95**	**85**	**11.8**	**20,164**	**12,164**	**65.8**	**1,970,206**	**1,139,876**	**72.8**	....	....
INTERNATIONAL											
American	11	13	—15.4	10,477	10,043	4.3	1,379,136	1,386,927	— 0.6	57.3	70.4
Braniff	5	4	25.0	8,098	9,039	—10.4	1,006,229	1,075,307	— 6.4	46.8	48.8
Delta	5	6	—16.7	5,768	6,892	—16.3	679,596	823,803	—17.5	45.2	52.8
Eastern, Overseas	44	35	25.7	43,299	47,291	33.8	6,695,131	5,019,893	33.4	69.2	54.7
San Juan	33	29	13.8	50,962	42,745	19.2	5,348,615	4,544,778	17.7	73.7	66.6
Havana	*	.....	.....	232	.....	....	22,116	.....	....	50.9	....
Bermuda	7	5	40.0	5,578	3,888	43.5	575,091	403,311	42.6	60.0	55.3
Mexico	4	1	300.0	6,527	658	891.9	749,309	71,804	943.5	53.1	39.3
National	10	7	42.9	6,279	5,208	20.6	724,247	591,470	22.4	56.7	53.4
Northwest	15	13	15.4	35,710	27,240	31.1	6,003,177	4,432,110	35.4	73.7	65.2
Hawaiian	2	1	100.0	4,578	3,609	26.8	513,987	398,495	29.0	66.0	59.8
Panagra	11	12	— 8.3	13,732	15,170	— 9.5	2,019,715	2,021,063	— 0.1	54.7	56.6
Pan American, System	280	283	— 1.0	412,467	412,727	— 0.1	52,371,395	50,940,275	2.8	66.2	62.4
Latin America	119	131	— 9.2	129,127	146,409	—11.8	16,351,623	17,568,179	— 6.9	66.5	66.5
Atlantic	130	116	12.1	182,079	154,522	17.8	22,429,268	19,404,149	15.6	61.9	61.9
Pacific	25	27	— 7.4	94,536	101,933	— 7.3	12,746,078	12,636,011	0.9	75.4	67.8
PDX/SEA-HON.	1	2	—50.0	3,135	4,781	—34.4	426,064	527,839	—19.3	48.7	49.2
Alaska	6	9	—33.3	6,725	9,863	—31.8	844,426	1,331,936	—36.6	57.9	57.5
Trans Caribbean	9	.....	.....	18,374	.....	....	1,626,820	.....	....	88.5	....
Trans World	40	32	25.0	116,364	86,352	34.8	13,752,059	10,442,296	31.7	60.4	64.0
United	12	12	.....	29,035	29,007	0.1	3,252,030	3,117,526	4.3	65.5	71.3
Western	1	1	.....	1,633	896	82.2	181,910	98,814	84.1	35.6	39.9
TOTALS	**443**	**418**	**6.0**	**721,238**	**649,865**	**11.0**	**89,691,443**	**79,949,484**	**12.2**	....	....
* Less than 1,000—286											
LOCAL SERVICE											
Allegheny	46	44	4.5	8,190	7,737	5.9	828,821	774,984	6.9	48.0	45.4
Bonanza	15	13	15.4	3,350	2,888	16.0	336,116	289,085	16.3	40.8	42.5
Central	13	12	8.3	2,410	2,227	8.2	249,044	227,975	9.2	30.3	31.2
Frontier	23	21	9.5	5,170	5,495	— 5.9	571,460	617,056	— 7.4	53.8	66.9
Lake Central	13	14	— 7.1	2,180	2,201	— 0.9	226,045	226,489	— 0.2	37.7	36.9
Mohawk	36	35	2.9	7,054	6,590	7.0	708,569	670,885	5.6	47.4	39.6
North Central	68	62	9.7	12,140	10,331	17.5	1,219,870	1,038,962	17.4	48.5	47.7
Ozark	35	35	.....	5,920	5,873	0.8	606,681	604,290	0.4	45.5	42.9
Pacific	33	30	10.0	7,148	6,436	11.1	703,269	633,282	11.1	48.7	53.5
Piedmont	36	38	— 5.3	7,589	7,932	— 4.3	767,679	796,810	— 3.6	52.7	57.4
Southern	18	18	.....	3,273	3,328	— 1.7	339,769	337,325	0.7	37.4	38.2
Trans-Texas	20	22	— 9.1	4,622	5,056	— 8.6	494,151	528,806	— 6.5	39.0	40.8
West Coast	22	25	—12.0	4,029	4,299	— 6.3	401,637	422,898	— 5.0	46.4	48.4
TOTALS	**378**	**369**	**2.4**	**73,075**	**70,393**	**3.8**	**7,453,111**	**7,168,847**	**4.0**	....	....
HELICOPTER SERVICE											
Chicago	10	6	66.7	176	84	109.5	18,037	10,514	71.6	26.0	30.5
Los Angeles	3	3	....	115	115	....	14,756	14,298	2.8	62.3	62.9
New York	9	9	....	169	165	2.4	18,734	19,213	— 2.5	44.6	48.4
TOTALS	**22**	**18**	**22.2**	**460**	**364**	**26.4**	**53,527**	**46,025**	**16.3**	....	....
ALASKAN											
Alaska	6	7	—14.3	4,046	2,796	44.7	801,801	682,314	17.5	50.7	45.9
Alaska Coastal	7	7	.....	595	559	6.4	69,320	65,500	5.8	63.6	63.8
Cordova	1	3	—66.6	308	714	—56.9	62,138	356,416	—82.6	57.8	47.5
Ellis	7	8	—12.5	389	446	—12.8	44,402	51,267	—13.4	66.2	67.0
Nor. Consolidated	3	3	.....	850	929	— 8.5	203,277	192,976	5.3	63.6	59.4
Pacific Northern	14	13	7.7	14,055	13,577	3.5	1,928,872	1,878,142	2.7	68.2	69.7
Reeve	1	1	.....	1,224	812	50.7	317,775	156,068	103.6	62.1	51.9
Wien	6	5	20.0	2,195	1,821	20.5	448,247	413,932	8.3	59.5	67.3
TOTALS	**45**	**47**	**—4.3**	**23,662**	**21,654**	**9.3**	**3,873,832**	**3,796,615**	**2.1**	....	....

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EN ROUTE

Wayne W. Parrish

How It Feels to Own A Bentley . . . Are Ya Listenin', Detroit?

Some years ago I got a real itch to own a Rolls-Royce. Not being able to walk into a showroom and plunk down a check for a new one, I decided to pick up a used one overseas. In Paris I found some fine old Rolls-Royces, but took a shine to a 1950 Bentley, which is made by Rolls-Royce, and bought it.

I figured that getting into the high-price Rolls race was like a poker game; once you get a chip you've got a chance to stay.

I enjoyed that 1950 British Bentley. I drove it through France and Spain and all the way to Denmark, and then shipped it home. I wrote all about this car and my travels and made the comment that it put a Cadillac to shame, or something of the sort.

That brought a fast retort from friend Roger Fleming of General Motors' Allison Division, who took real umbrage at the idea that anything could possibly be finer than a Cadillac. Rog said he'd get a new Cadillac for me to drive for a week or so and let me prove it to myself. Well, I'm still waiting. I never did get that Cadillac for a free run but the local Cadillac salesmen kept calling for several years asking if I was ready for a trade-in until I blew a stack one day, putting most of the Washington telephone system out of whack and I ain't heard from one of them there patronizing Cadillac sales gents since.

What I really wanted was one of those sleek Bentley S models introduced by Rolls in the spring of 1955. My 1950 model had an unusual and somewhat clumsy hand gearshift, made especially for the previous owner, and there were certain unstandard variations which always caused me trouble in getting the car through the tough District of Columbia vehicle inspection. The car itself was fine, wonderful on the road, with a very quiet engine, but I went through the Rolls factory in England and saw all those new jobs being turned out, virtually custom built, so early in 1957 I began negotiating for a trade-in—for a new Bentley, not a Cadillac.

May 1 was the big day of delivery, and what a handsome car it was. Sand and sable colors with some 14 coats of paint; real, genuine leather that smelled good; inlaid woodwork on the instrument panel instead of some plastic gluck; automatic transmission, improved steering and brakes, and—well, I really celebrated the arrival of my new Bentley.

Engine Almost Too Quiet

Of course it isn't perfect. For example, the engine is so damned quiet you're apt to try to start it without knowing it's already on. You can park it in any old single parking space. It will fit into any old garage without having to build an extension. It goes around sharp curves on country roads so easily that you and your passengers don't roll out the side. You sit high enough so you can see what's ahead of you while driving in traffic. And at the end of 750 miles in a day's driving you're still so peppy and relaxed that you're tempted to add another 150 miles before turning in. And it will give over 15 miles per gallon at high speeds.

I've got over 10,000 miles on my car now and I won't change for seven or eight years, anyway. It's a perfect delight to handle. It has only a six-cylinder engine, and a Ford or Chevy can take off from a traffic stop faster, but it has real solid power, power when you need and want it, and for long, sustained driving it will out-do safely any other car on the road—and get there faster with less strain. Not that I want an accident but I feel sorry for the other guy in case there is a collision; the Bentley is made of real solid stuff, not tin.

I haven't seen an American-built car in some years that I'd want to own. Not tempted in the slightest. I'm out of that glamour - chrome - overpowered - fast - obsolescent rat race for a long time to come. And I'll come out ahead in cost, too. The Bentley comes high, but if you will just stick with the classic designs (changed about every ten years), you have an investment that makes it cheaper in the long run. Even really old Rolls-Royces and Bentleys bring good trade-in prices. They never wear out.

In 1955, Rolls-Royce began making both the standard Rolls and the standard Bentley absolutely identical except for the front grill, which costs $300 more. "People who feel diffident about driving a Rolls-Royce can buy a Bentley," the ads say. The dictionary says diffident means "wanting confidence in oneself; unduly timid, retiring, shrinking." The hell with that stuff. I got the confidence, I ain't very retiring or timid. But after having become a loyal Bentley fan I'd feel like an awful rat to desert a Bentley for a Rolls. I want driving pleasure, not a name, anyway.

Hey There, Mr. Inskip!

One of the smartest automobile ads ever written had the following heading: "At 60 miles an hour the loudest noise in this new Rolls-Royce comes from the electric clock." Well, you know, this is the truth. Except remind me to tell the New York distributor, Inskip, that somebody left a tiny airhole in the corner of the windscreen and at 60 m.p.h. I get a wind whistle as well as the noise from the clock. So, Inskip, either change the ad or fix that tiny hole. But kidding aside, it's a very quiet car.

Oh sure, I had some trouble the first year. At 1,500 miles the fluid leaked out of the steering box, but that was quickly remedied. And some trouble developed in the automatic transmission, but Inskip replaced the whole mechanism pronto with no questions asked. (Are you listening, Detroit?) And one of my locks got jammed when somebody inside the car pushed the lever just as I put the key in on the outside. But otherwise, the car has worked like a charm and it's hardly broken in at 10,000 miles. And at 90 and 100 m.p.h. it's just as steady, calm and collected as it is at 60, but don't get the idea I usually drive that fast—I just wanted to see what it would do and I didn't get it near the top cruising at 100.

The automatic transmission isn't quite as smooth in the overall as a few American types, but it has great offsetting advantages; it has four gear selections, giving the driver a lot of control under varying conditions. And it moves from one speed to another with the greatest of ease. At all times you know you have a powerful car under full control. It isn't overpowered (and thereby dangerous) like a lot of lightweight American cars.

Yes, I still belong to the Bentley Drivers Club and we have our own emblem and our own tie. (I wore the tie at a Rolls-Royce party in Paris last year and not one Rolls employe recognized it! Downright shameful, if not indeed sinful!) Of course, I find it difficult to attend the club meets at such places as the Hare & Hounds, Otterspool, near Marple, Cheshire; or Bull's Head Inn at Shenstone, Staffordshire; or The Rock Inn, Chiddingstone, Kent. But by golly, we know good cars—the best in the whole blessed world—and it sure raises my morale when I zip in and out of traffic on Massachusetts Avenue in Washington or sail through the Carolinas on a fine early morning. Yep, I'm proud to be a Bentley owner, bless you all.

BENTLEY S, similar to one owned by author, in front of Rolls-Royce plant in Crewe, England. To right of WWP is James H. Stevens, British aviation writer.

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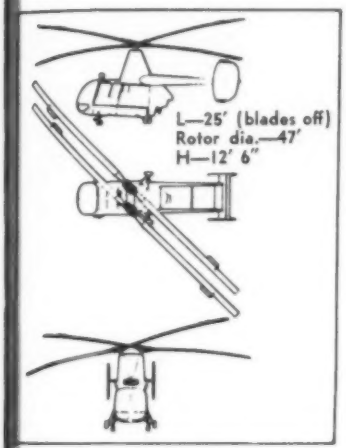

KAMAN H-43A (USAF)

TYPE: 5-place, single-engine, utility helicopter. WEIGHTS: empty—4,380 lbs.; gross—6,800 lbs. POWERPLANT: Pratt & Whitney R1340-48; rating—600 hp. PERFORMANCE: max. speed—100 kts; cruise speed—70 kts; range—190 n.mi. MFR: The Kaman Aircraft Corp., Bloomfield, Conn.

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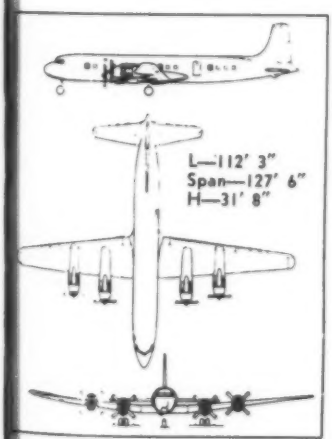

DOUGLAS DC-7C

TYPE: 62-99 passenger, four-engine, commercial transport. WEIGHTS: empty—72,150 lbs.; gross—143,000 lbs.; payload—28,250 lbs POWERPLANS: (4) Wright R3350-18EA4s; rating—3,460 hp. PERFORMANCE: max. speed—405 mph; cruise speed—360 mph; initial rate of climb—1,050 fpm; max. range—5,000 mi.; takeoff distance—6,000 ft.; landing distance—5,500 ft. MFR: Douglas Aircraft Co., Inc., Santa Monica, Calif.

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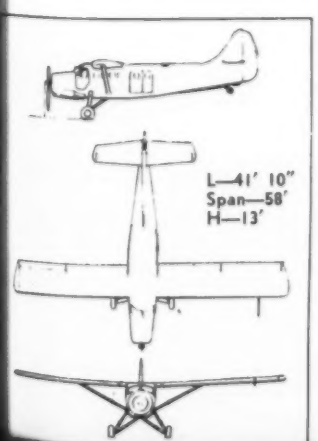

De HAVILLAND DHC-3 OTTER

TYPE: 9-11 place, single-engine, military and commercial utility transport. WEIGHTS: empty—4,368 lbs.; gross—8,000 lbs. POWERPLANT: Pratt & Whitney R1340-S3H1-G; rating—600 hp. PERFORMANCE: max. speed—160 mph; cruise speed—138 mph; initial rate of climb—735 fpm; range—1,098 mi.; takeoff distance over 50 ft. obstacle—1,200 ft.; landing distance over 50 ft. obstacle—1,050 ft. MFR: The de Havilland Aircraft of Canada Ltd., Downsview, Ont., Canada.

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Aircraft Data Cards

Aircraft selected for the data cards in this issue of AMERICAN AVIATION are Kaman's H-43A, Douglas' DC-7C and De Havilland's DHC-3 Otter. Kaman's H-43A, twin-rotor helicopter, is a production aircraft currently being delivered to the Air Force for crash rescue duties. Douglas' DC-7C is a larger, longer-range version of the DC-7B. It was placed in commercial airline service June 1956 and now forms part of the equipment of both U.S. and foreign international carriers. It was also the last commercial piston-engine transport to be built by Douglas. De Havilland's DHC-3 Otter is used by operators all over the world and is in service with the U.S. Army. Noted for its ability to operate from unimproved airstrips, the Otter is available as a landplane, seaplane, amphibian, ski-plane and wheel ski-plane.

KAMAN H-43A

Aircraft Data Card
December 1, 1958

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DOUGLAS DC-7C

Aircraft Data Card
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De HAVILLAND DHC-3 OTTER

Army: U-1A
Navy: UC-1

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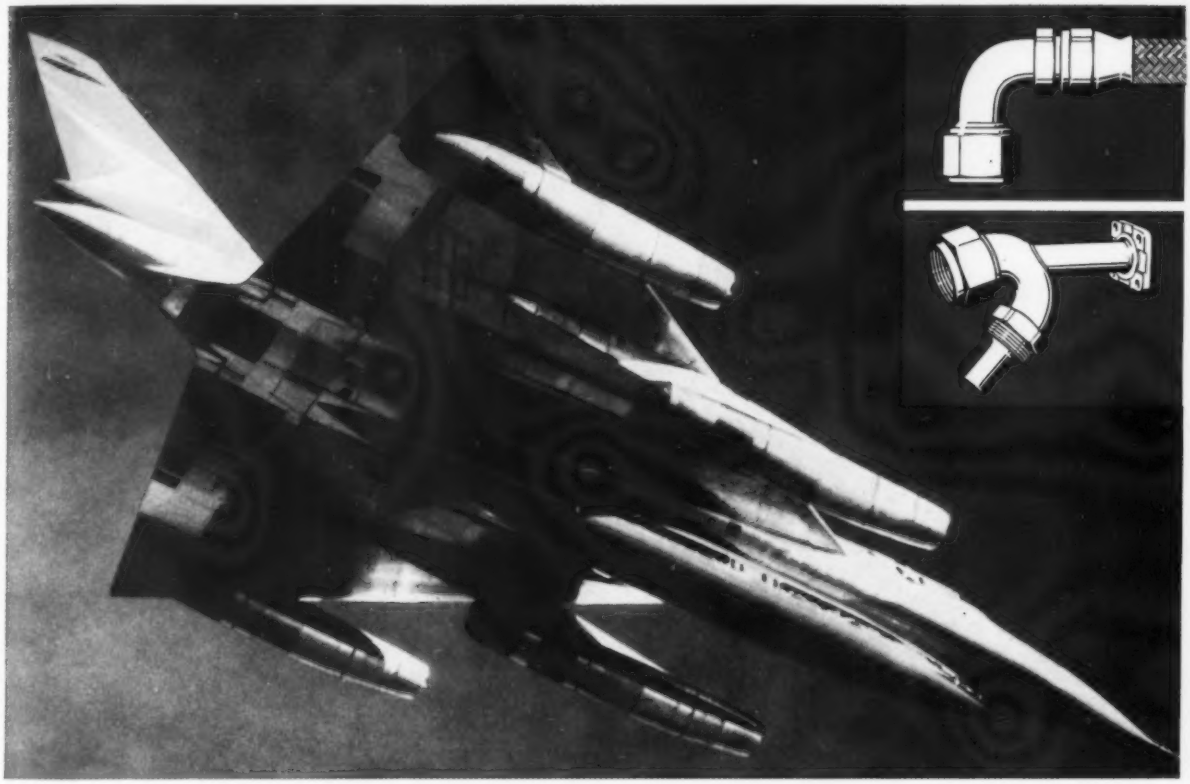
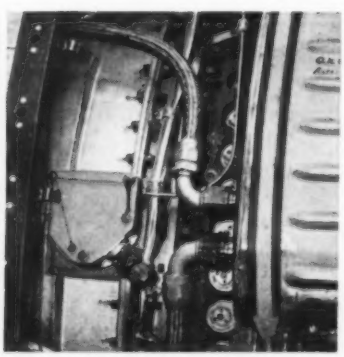


Aeroquip Hose of Teflon and Tube Assemblies Simplify Installation of Power Plant Fluid Lines on B-58

This bossed tubing configuration on an Aeroquip 666 Hose Line of Teflon is connected to the engine hydraulic pump inlet.



These 666 Hose Lines of Teflon with swivel elbow fittings are installed on the lube oil tank of the J 79 engine.

Fluid line assemblies combining 666 Hose of Teflon and precision formed tubing were fabricated by Aeroquip for Convair's supersonic B-58. Designed for close-quarter connection of fluid lines around J 79 engines, these assemblies help simplify installation and removal of the engines for routine maintenance.

Aeroquip has the products, the engineering background, and the production facilities to help simplify your high performance fluid line requirements. Your letterhead request to our sales engineering staff will receive prompt attention. Mail coupon below for new 68-page Catalog No. 103, giving full data on Hose Lines of Teflon.

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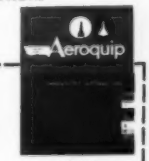
Teflon is DuPont's trade name for its tetrafluoroethylene resin



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Harry B. Combs (*left*), owner and president of Combs Aircraft, Inc., and Wayne M. Brown, executive vice president.

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